N61165.AR.003875
CNC CHARLESTON
5090.3a

HAZARDOUS RANKING SYSTEM FINAL SCORING BOOK 2 CNC CHARLESTON SC
7/15/1992
KEMRON

CHARLESTON NAVAL BASE
HAZARDOUS RANKING SYSTEM
FINAL SCORING
BOOK II

COMPREHENSIVE LONGTERM
ENVIRONMENTAL ACTION NAVY
DISTRICT II
CONTRACT N62467-89-D-0318
CTO-044

JULY 15, 1992

SOUTHERN DIVISION, CODE 18
NAVAL FACILITIES
ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, SC 29411-0068
(803) 743-0341

4.0 DOCUMENTATION PACKAGE

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CHARLESTON NAVAL BASE - 07/13/92

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4. MS. BLANCHE MITCHELL. PUBLIC AFFAIRS. CHARLESTON NAVAL BASE. TELECON. WITH CHICK MASON, ENSAFE. MAY 4, 1992.

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6. K + E WEATHERPROOF LEVEL BOOK #82 0036.
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FINAL REPORT
RCRA FACILITY INVESTIGATION (RFI)
CHARLESTON NAVAL BASE
CHARLESTON, SOUTH CAROLINA

Report to:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

SEPTEMBER 1991

KEMRON
ENVIRONMENTAL SERVICES

PROTECTING OUR ENVIRONMENTAL FUTURE

SECTIONS CITED FROM REFERENCE 1

SECTION: 2.3, 2.3.1, 2.3.3, 2.3.5, 2.6.1, 2.6.2, 2.6.5, 2.6.6, 2.6.7, 2.6.8, 2.6.9

FIGURE: 2-11, 2-12, 2-14, 2-16, 2-17, 2-19

TABLE: 2-2, 2-3, 2-5, 2-8, 2-9, 2-10, 2-11

APPENDIX: A, D, F-2, G, I

RECORD OF ☐ VISIT ☐ CONFERENCE OR ☑ TELEPHONE CALL

TIME: 9:10 am

DATE: 5/28/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION

Joe Moran 803-762-5000
South Caroline Dept. of Wildlife and
Marine Resources

COPIES TO:

SUBJECT: Annual Catch of Marine Resources

FILE:

DIGEST

Mr. Moran stated that in 1986 676,215 pounds of crabs, finfish, and shellfish were caught in the Cooper River, Ashley River, Charleston Harbor, Lake Moultrie, and the Intercoastal waterway up to the Isle of Palms. Of this, 492,387 pounds were crabs. Shellfish were less than 1,000 pounds. The principal finfish caught commercially are channel bass and herring (both saltwater fish). Crabbing occurs upstream to Snow Point on the Cooper River and Drayton on the Ashley River. Crabbing and most finfish harvesting as well as all shellfish harvesting does not occur in Lake Moultrie since it is freshwater.

In 1986 7,142,661 pounds of seafood product was caught within a 3 mile distance along the entire Atlantic coast of South Carolina. In the 3-12 mile limit of the coast 65,556 pounds of seafood product was caught.

All of this information is for commercial fishing. There is no data on recreational fishing available.

CONCLUSION, ACTION TAKEN, OR REQUIRED

DATE: 5/28/92

ORIGINATOR: P. McMahon

RECORD OF ☐ VISIT ☐ CONFERENCE OR ☑ TELEPHONE CALL

TIME: 2:30pm

DATE: 5/4/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION

Blanche Mitchell
Public Affairs
Charleston Naval Station

COPIES TO:

SUBJECT

Population on base

FILE:

DIGEST

According to Ms. Mitchell there are 10,550 people living on base, including dependents. There are also 42,188 people who regularly work on base, including military, civilian, and contract employees. The weapons station was not included in this calculation. This gives a total of 52,738 people either living or working on base.

CONCLUSION, ACTION TAKEN, OR REQUIRED

DATE: 5/4/92

ORIGINATOR: R. Allen Larson

Environmental and Safety Designs, Inc.

ENSAFE℠

5705 STAGE RD. MEMPHIS, TN. 38134 ☎(901)372-7962

FORM1

FINAL SUBMISSION (100%)
CONFIRMATION STUDY

ASSESSMENT OF POTENTIAL OIL AND HAZARDOUS-WASTE CONTAMINATION OF SOIL AND GROUND WATER AT THE CHARLESTON NAVAL SHIPYARD, CHARLESTON, SOUTH CAROLINA

Prepared for

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Charleston, South Carolina

October 29, 1982

GERAGHTY & MILLER, INC.
Water-Resources Consultants
13902 North Dale Mabry Highway
Tampa, Florida

SECTIONS CITED FROM REFERENCE 5

PAGE: 1, 2, 3

April 30, 1992

Visit to Charleston Naval Base, Charleston, SC.

0800 meet with Kim Queen of SouthDiv.

≈1000 meet with Glen Lawton of the Charleston Naval Base. He will give us a tour of the base.

DRMO Building 1617

SWMU #1 - Near Cooper River. Is now a parking lot. Was used for hazardous waste storage. Floor is part asphalt/part dirt. Looks like dust can be generated very easily by wind and heavy machinery driving in area.

SWMU #2 Lead contaminated Area

was reportedly a storage area for lead batteries. Is now a scrap metal dump. A lot of heavy machinery in area can contribute to dust generation.

SWMU #21 old Paint Storage Area

Was a ramp leading up to a cement slab at the edge of the Cooper River. Paint was reportedly stored to await off-site transport.

SWMU #23 New Plating Shop WWTS

Sign indicating hazardous waste accumulation area. Nothing particular noted.

SWMU #28 Waste Paint Storage Area, West End Pier C Next to paint shop. Appeared to be an outdoor storage area.

SWMU #26 Waste Storage Area, Bldg 64-40, Pier C. Similar situation of SWMU #28.

SWMU #27 Waste Storage Area, East End, Pier C. At end of pier near Cooper River. Waste paint, oily rags was reportedly stored here prior to shipment off base.

SWMUs #22 & #25 old Plating Shop Waste Treatment System/Building 44, old plating operation

Both located in alley of plating shop area. Nothing in particular noted.

SWMU #33 Waste Paint Storage Area, West End, Dry Dock #2. Waste Paint Storage on Drydock. staging area for industrial equip.

SWMU #32 Waste Paint Storage Area
Building 195
Waste Paint Area. Work done on
pier generated waste.

SWMU #31 Waste Paint Storage Area,
Dry Dock #5
Similar to SWMU #32. Located at
the bottom of the dry dock.

SWMU #30 Satellite Accumulation Area,
Building 13
Chain-link cage with drums, label
on cage said "Hazardous Waste".
Reportedly held other material in the past.

SWMU #18 PCB Spill Area
PCB contaminated oil from transformers
reportedly spilled over time. Presently an
empty drum storage.

SWMU #5 Battery Electrolyte Treatment Area
Battery acid was reportedly dumped into a pit, was neutralized, then went into the N. Charleston sewer system. The area is paved over with little exposed soil.

SWMU #36 Battery Treatment Facility
Area used to discharge battery acid from submarine batteries into SWMU #5.

SWMU #4 Pesticide Storage Building
Pesticides reportedly stored in Building #381.

SWMU #3 Pesticide Mixing Area
Pesticides were reportedly washed here into the soil. Is now a grassy area.

SWMU #6 Grass is present on this site to prevent some wind erosion

SWMU # 24 Waste Oil Reclamation Facility
Aboveground tank which was reportedly
cleaned recently. Area is bermed.

SWMUs 29, 34, 35 Buildings X-10, X-12
All general disposal areas for
hazardous wastes. Spillages reportedly
occurred over the years.

SWMU #8 Oil Sludge Pit Area
Converted to a parking lot.

SWMUs #19, #20 Solid Waste Transfer/
Waste Disposal Area - In an area
of landfill behind base. Temporary
storage of some waste before transport.

SWMU #9 Closed Landfill

Large landfill area. Covered with grass, trees, near bodies of water. Some areas are paved.

SWMU #12 Old Fire Fighting Training Area. Could not be found. Probably covered over with plant growth since it was reportedly closed in 1972.

SWMU #16 Paint Storage Bunker Next to body of water. Reportedly clean closed.

SWMU #14 Chemical Disposal Area General Landfill in the woods and partly in field.

SWMU #15 Incinerator
Small incinerator in fenced area.

SWMU #17 Oil Spill Area
Large brick building. Not sure where the contamination is. Probably located beneath the building.

SWMU #13 Current Fire Training Area
Charred buildings noted. Area bermed. Run-off reportedly runs into oil/water separator into sanitary sewer.

SWMU #11 Caustic Pond
Asphalt covering site. Reportedly is not a threat.

Many of these SWMUs are adjacent to bodies of water. SWMUs 1 and 2 are next to the Cooper River. SWMU 9 is partially in marsh areas which are connected with Sh. Yard Creek.

The Base is surrounded by a maintained fence and is guarded at all times.

No potential resources have been identified on Base.

federal register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

SECTIONS CITED FROM REFERENCE 7

FIGURE: 3.2, 6.2, 6.3

TABLE: 4-2

FINAL
CONTAMINATION AND EXPOSURE ASSESSMENT FOR THE LEAD CONTAMINATION WITHIN THE DEFENSE REUTILIZATION AND MANAGEMENT OFFICE

Prepared for:

NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
Charleston, South Carolina

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Tampa, Florida

ESE No. 85-603-0500-0120

October 1986

SECTIONS CITED FROM REFERENCE 8

SECTION: 2.1, 2.3, 2.4, 2.5, 4.0, 4.1, 4.3

TABLE: 3.2-1, 4.1-1, 4.3-1

FIGURE: 2.4-1

INITIAL ASSESSMENT STUDY
NAVAL BASE CHARLESTON

UIC No. N61466

May 1983

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING,INC. (ESE)
P.O. Box ESE
Gainesville, Florida 32602

Contract No. N62474-81-C-9383

Initial Assessment Study Team Members

Bruce N. McMaster, Chemist, Project Manager
John D. Bonds, Chemist, Team Leader
Russell V. Bowen, Civil Engineer
Stephen A. Denahan, Hydrogeologist
Ernest E. Frey, Civil Engineer
Charles D. Hendry, Chemist
Carla F. Jones, Historian/Document Coordinator
John H. Wiese, Ecologist

Prepared for:

NAVY ASSESSMENT AND CONTROL
OF INSTALLATION POLLUTANTS (NACIP) DEPARTMENT
Naval Energy and Environmental Support Activity (NEESA)
Port Hueneme, California 93043

SECTIONS CITED FROM REFERENCE 9

SECTION: 2.1, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.4.2

Equal Opportunity Agency

South Carolina Wildlife & Marine Resources Department

James A. Timmerman, Jr., Ph.D.
Executive Director
W. Brock Conrad, Jr.
Director of
Wildlife and Freshwater Fisheries

June 3, 1992

Mr. Charles Mason
Environmental & Safety Designs, Inc.
5724 Summer Trees Dr.
P.O. Box 341315
Memphis, TN 38184-1315

Dear Mr. Mason:

I have reviewed our data on the vicinity of Charleston, as outlined in your letter of May 27. A number of rare, threatened, or endangered species or communities are recorded in or near the specified area. Please see the enclosed printout and map for exact locations. The numbers in red on the map correspond to the numbers in the DOTNUM field on the printout.

I have enclosed a list of species and communities tracked by our agency in Charleston County, as an indication of other potential occurrences on the site.

Please keep in mind that this information is derived from our existing database, and we do not assume that it is complete. Areas not yet inventoried by our biologists may contain important species. Also, our data are always in need of updating because as natural populations change over time, species must be added, dropped, or reclassified.

Thank you for your inquiry. If I can be of further assistance, please call me at 803-734-4032.

Sincerely,

Katherine Boyle

Katherine Boyle
Data Manager
S.C. Heritage Trust

The S.C. Heritage Trust database includes the following fields of data:

ELEMENT - scientific and common names.

EOCODE - element occurrence code, indicating taxonomic class in bytes 1-2:

AA - Animals, Amphibians
AB - Animals, Birds
AF - Animals, Fish
AM - Animals, Mammals
AR - Animals, Reptiles
PD - Plants, Dicots
PG - Plants, Gymnosperms
PM - Plants, Monocots
PP - Plants, Pteridophytes

GRANK/SRANK - the Nature Conservancy rating of degree of endangerment:

G1 - Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction
G2 - Imperiled globally because of rarity or factor(s) making it vulnerable
G3 - Either very rare throughout its range or found locally in a restricted range, or having factors making it vulnerable
G4 - Apparently secure globally, though it may be rare in parts of its range
G5 - Demonstrably secure globally, though it may be rare in parts of its range
GH - Of historical occurrence throughout its range, with possibility of rediscovery
GX - Extinct throughout its range
GU - Status unknown

S1 - Critically imperiled state-wide because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation
S2 - Imperiled state-wide because of rarity or factor(s) making it vulnerable
S3 - Rare or uncommon in state
S4 - Apparently secure in state
S5 - Demonstrably secure in state
SA - Accidental in state (usually birds or butterflies that are

far outside normal range)
SE - Exotic established in state
SH - Of historical occurrence in state, with possibility of rediscovery
SN - Regularly occurring in state, but in a migratory, non-breeding form
SR - Reported in state, but without good documentation
SX - Extirpated from state
SU - Status unknown

STATUS - legal status:

FE - Federal Endangered
FT - Federal Threatened
NC - Of Concern, National (unofficial - plants only)
RC - Of Concern, Regional (unofficial - plants only)
SE - State Endangerd (official state list - animals only)
ST - State Threatened (official state list - animals only)
SC - Of Concern, State (unofficial - animals)
SL - Of Concern, State (unofficial - plants)
SX - State Extirpated
CU - Candidate Undetermined (Federal status review)
UN - Undetermined

TOPOMAP - the USGS topo-map quadrangle in which the element occurred.

DOTNUM - a number given the occurrence to identify it among all occurrences on the topo-map.

LAT and LONG - latitude and longitude.

SOURCE - source of information.

DATE - date of information.

DESC - description of the occurrence and its location.

All information is based on the existing S.C. Heritage Trust database, and we do not assume that it is complete. Areas not yet inventoried by our biologists may contain important species. Also, our data are always in need of updating because as natural populations change over time, species must be added, dropped, or reclassified.

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*013*SC
GRANK:
TOPOMAP: 516 - CHARLESTON
LAT: 325042
SOURCE: D. FORSYTHE,BIOLOGY DEPT. THE CITADEL

Charleston

STATUS: ST
SRANK:
DOTNUM: 1
LONG: 795645
DATE: 76-07-01

DESC: COLONY LOCATED ON THE GRAVEL ROOF OF THE COMMISSARY. THERE ARE ABOUT 60 BIRDS, 28 OF WHICH ARE DOWNY STAGE YOUNG SEVEN ACTIVE NESTS WERE REPORTED. NO IMMEDIATE THREATS ARE FORSEEN.

ELEMENT: AMBYSTOMA TIGRINUM TIGRINUM / EASTERN TIGER SALAMANDER
EOCODE: AAAAA01146*001*SC
GRANK: G5T5
TOPOMAP: 516 - CHARLESTON
LAT: 325212
SOURCE: C. ROBINSON CHARLESTON MUSEUM

STATUS: SC
SRANK: S2S3
DOTNUM: 2
LONG: 795942
DATE: 33-02-01

DESC: EASTERN TIGER SALAMANDER. REPORTED ON ROAD, 12 MILES WEST OF CHARLESTON ON MEETING ST. ONE SPECIMEN TAKEN. LOCATION UNCLEAR.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*031*SC
GRANK: G5
TOPOMAP: 516 - CHARLESTON
LAT: 325110
SOURCE: MURPHY AND COKER

STATUS: SC
SRANK: S4
DOTNUM: 3
LONG: 795710
DATE: 79-11-01

DESC: ACTIVE NEST REPORTED ON COOPER RIVER NEAR THE CHARLESTON NAVAL YARD.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*069*SC
GRANK: G5
TOPOMAP: 516 - CHARLESTON
LAT: 325224
SOURCE: MURPHY AND COKER

STATUS: SC
SRANK: S4
DOTNUM: 4
LONG: 795648
DATE: 79-11-01

DESC: ACTIVE NEST ON A SPOIL ISLAND NEAR CLOUTER CREEK, OFF THE COOPER RIVER

ELEMENT: MUSTELA FRENATA / LONG-TAILED WEASEL
EOCODE: AMAJF02030*003*SC
GRANK: G5
TOPOMAP: 516 - CHARLESTON
LAT: 325212
SOURCE: A. WIGGINS CHARLESTON MUSEUM

STATUS: UN
SRANK: S3S4
DOTNUM: 5
LONG: 795920
DATE: 25-02-01

DESC: REPORTED 8 MILES NORTH OF CHARLESTON.

ELEMENT: ROOKERY,HERONS AND ALLIES,NON-FORESTED
EOCODE: ORXXX00005*003*SC
GRANK:
TOPOMAP: 516 - CHARLESTON
LAT: 325040
SOURCE: JOHN DENNIS

STATUS: UN
SRANK:
DOTNUM: 6
LONG: 795526
DATE: 77-01-01

DESC: THE GUGGENHEIM PLANTATION CONTAINS A SPOIL AREA ON THE COOPER RIVER 2 MI N FROM DRUM ISLAND ON THE EAST BANK BIRDS THAT HAVE BEEN REPORTED INCLUDE LOUISIANA HERON, LITTLE BLUE HERON, NIGHT HERONS, AND WHITE IBIS NO POPULATION FIGURES REPORTED

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*028*SC
GRANK: G5
TOPOMAP: 516 - CHARLESTON
LAT: 324940
SOURCE: MURPHY AND COKER
STATUS: SC
SRANK: S4
DOTNUM: 7
LONG: 795310
DATE: 79-11-01
DESC: ONE ACTIVE NEST REPORTED ALONG HOBCAW CREEK, JUST EAST OF THE WANDO RIVER NEAR CHARLESTON.

ELEMENT: MARITIME SHRUB THICKET
EOCODE: CTCXX00070*003*SC
GRANK: G4
TOPOMAP: 516 - CHARLESTON
LAT: 324852
SOURCE: J. DENNIS
STATUS: UN
SRANK: S2S3
DOTNUM: 8
LONG: 795530
DATE: 75-04-01
DESC: DRUM ISLAND, IN THE COOPER RIVER, HAS BEEN USED AS A SPOIL AREA BY THE CORPS DREDGING OPERATION IN CHARLESTON HARBOR. REMAINING SHRUB COMMUNITY COMPOSED OF BACCHARIS, TAMARIX GALLICA, MORUS, CELTIS LAEVIGATA, IVA FRUTESCENS, AND BORRICHIA FRUTESCENS ALSO SITE OF A MAJOR ROOKERY

ELEMENT: ROOKERY;HERONS AND ALLIES,FORESTED
EOCODE: ORXXX00006*011*SC
GRANK:
TOPOMAP: 516 - CHARLESTON
LAT: 324852
SOURCE: JOHN DENNIS
STATUS: UN
SRANK:
DOTNUM: 8
LONG: 795530
DATE: 77-01-01
DESC: LARGEST WHITE IBIS ROOKERY IN THE STATE (25-50K PAIR) IS AT NORTH END OF DRUM ISLAND. AREA ALSO HAS SEVERAL HUNDRED PAIRS OF GLOSSY IBIS, SNOWY EGRET, BLACK-CRND NIGHT HERON, YELLOW-CRND NIGHT HERON, LOUISIANA HERON, AND GREEN HERON OCCASIONAL NESTING OF BLACK NECKED STILT INACTIVE SINCE 1987.

ELEMENT: PLECOTUS RAFINESQUII / RAFINESQUE'S BIG-EARED BAT
EOCODE: AMACC08020*017*SC
GRANK: G4
TOPOMAP: 516 - CHARLESTON
LAT: 324815
SOURCE: E. CHAMBERLAIN (UF #12035)
STATUS: SE/C2
SRANK: S2?
DOTNUM: 9
LONG: 795706
DATE: 33-08-17
DESC: CHARLESTON. ONE ANIMAL CAPTURED IN A CLOSET

ELEMENT: MONOTROPSIS ODORATA / SWEET PINESAP
EOCODE: PDERI0V010*003*SC
GRANK: G3
TOPOMAP: 516 - CHARLESTON
LAT: 324815
SOURCE: F. H. EARLE NYBG N. Y BOT GAR.
STATUS: RC
SRANK: S1
DOTNUM: 9
LONG: 795706
DATE: 80-01-01
DESC: CHARLESTON, CHARESTON CO., SC UPLAND WOODS IN 1880 EXACT LOCATION UNKNOWN.

ELEMENT: BOTRYCHIUM LUNARIOIDES / WINTER GRAPE-FERN
EOCODE: PPOPH01090*002*SC
GRANK: G4?
TOPOMAP: 516 - CHARLESTON
LAT: 324815
SOURCE: (NCU)
STATUS: UN
SRANK: S?
DOTNUM: 9
LONG: 795706
DATE: 00-00-00
DESC: PICTURE FROM MICHAUX'S HERBARIUM WITH CHARLESTON AS LOCATION. EXACT LOCATION UNKNOWN DATED 1850

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*017*SC
GRANK:
TOPOMAP: 516 - CHARLESTON
LAT: 324735
SOURCE: D. FORSYTHE, BIOLOGY DEPT.THE CITADEL
STATUS: ST
SRANK:
DOTNUM: 10
LONG: 795425
DATE: 76-07-01
DESC: LEAST TERNS NESTED ON HOG ISLAND FOR THE FIRST TIME THIS YEAR. THIS SPOIL ISLAND WAS CREATED BY DREDGING OPERATIONS AT PATRIOTS POINT. HEAVY RAINS DURING MAY AND JUNE DESTROYED CHANCES FOR SUCCESSFUL BREEDING. AT HEIGHT OF SEASON, APPROXIMATELY 35 BIRDS WERE PRESENT WITH ELEVEN NESTS.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*030*SC
GRANK: G5
TOPOMAP: 516 - CHARLESTON
LAT: 324642
SOURCE: MURPHY AND COKER
STATUS: SC
SRANK: S4
DOTNUM: 11
LONG: 795446
DATE: 79-11-01
DESC: ACTIVE NEST REPORTED ON SHUTES FOLLY ISLAND IN CHARLESTON HARBOR.

ELEMENT: ACIPENSER BREVIROSTRUM / SHORTNOSE STURGEON
EOCODE: AFCAA01010*010*SC
GRANK: G3
TOPOMAP: 516 - CHARLESTON
LAT: 324513
SOURCE: MARCHETTE
STATUS: FE
SRANK: S3S4
DOTNUM: 12
LONG: 795402
DATE: 78-09-01
DESC: CAUGHT BY GILLNET BY MARCHETTE CHARLESTON HARBOR AT FT. JOHNSON. ONE SPECIMEN.

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*016*SC
GRANK:
TOPOMAP: 516 - CHARLESTON
LAT: 324652
SOURCE: D. FORSYTHE, BIOLOGY DEPT.THE CITADEL
STATUS: ST
SRANK:
DOTNUM: 13
LONG: 795814
DATE: 76-06-01
DESC: TERNS NESTED IN A DIRT FILLED PORTION OF SPARTINA MARSH THAT WAS TO BE DEVELOPED AS A SHOPPING CENTER, PLANS NOW UNCERTAIN. A POPULATION OF 100 BIRDS WAS OBSERVED IN 1975 AT LEAST 80 YOUNG WERE BANDED SITE IS NEAR THE RIVERVIEW HOLIDAY INN

ELEMENT: PSILOTUM NUDUM / WHISK FERN
EOCODE: PPPSI01020*002*SC
GRANK: G5
TOPOMAP: 516 - CHARLESTON
LAT: 324643
SOURCE: W. CULP AND W. MICHENER (CLEMS)
STATUS: SL
SRANK: S1S2
DOTNUM: 14
LONG: 795640
DATE: 77-04-02
DESC: ON OLD BRICK WALL AT ABOUT #15 TO #40 MONTAGUE ST., BY OLD CHARLESTON LIBRARY IN CHARLESTON

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
EOCODE: AMAFF08011*008*SC
GRANK: G?
TOPOMAP: 516 - CHARLESTON
LAT: 324634
SOURCE: R. COLEMAN (CHM)
STATUS: UN
SRANK: S?
DOTNUM: 15
LONG: 795809
DATE: 39-12-00
DESC: ST. ANDREWS PARISH ONE MALE CAPTURED

ELEMENT: PSILOTUM NUDUM / WHISK FERN
EOCODE: PPPSI01020*004*SC
STATUS: SL
GRANK: G5
SRANK: S1S2
TOPOMAP: 516 - CHARLESTON
DOTNUM: 15
LAT: 324634
LONG: 795809
SOURCE: J. M. MACDOUGAL 187 (DUKE)
DATE: 75-12-12
DESC: CITY OF CHARLESTON; WEST BANK OF THE ASHLEY RIVER: WEST SIDE OF ALBEMARLE ROAD, ABOUT 1300 FEET SOUTH OF THE INTERSECTION WITH HWY 17; ON HUMMOCKS AROUND SOUTHERN EDGE OF SEASONAL SWAMP.

James Island

ELEMENT: ROOKERY;SHOREBIRDS
EOCODE: ORXXX00R01*001*SC
GRANK:
TOPOMAP: 531 - JAMES ISLAND
LAT: 323736
SOURCE: D. FORSYTHE,BIOLOGY DEPT,THE CITADEL
STATUS: UN
SRANK:
DOTNUM: 1
LONG: 795915
DATE: 00-00-00
DESC: 4 SHOREBIRD SPECIES NESTED ON BIRD KEY. LEAST TERN NUMBERS HAVE DROPPED FROM 450 PR.IN 72 TO 20 IN 75. BLACK SKIMMER AND GULL BILLED TERNS ARE STABLE AT +150PR. COMMON TERN 1 PR. BLUE WINGED TEAL STOP HERE DURING MIGRATION. IMPORTANT NESTING AREA FOR PELICANS.

ELEMENT: OPHISAURUS COMPRESSUS / ISLAND GLASS LIZARD
EOCODE: ARACB02020*001*SC
GRANK: G4
TOPOMAP: 531 - JAMES ISLAND
LAT: 323943
SOURCE: G. R. LUNZ CHARLESTON MUSEUM
STATUS: C2
SRANK: S1S2
DOTNUM: 2
LONG: 795555
DATE: 34-06-01
DESC: ISLAND GLASS LIZARD. REPORTED ON FOLLY ISLAND (EXACT LOCATION NOT GIVEN). E # 15, E # 19 AND E # 20.

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*005*SC
GRANK:
TOPOMAP: 531 - JAMES ISLAND
LAT: 323944
SOURCE: DR. FORSYTHE,BIOLOGY DEPT.THE CITADEL
STATUS: ST
SRANK:
DOTNUM: 3
LONG: 795640
DATE: 76-06-01
DESC: THIS COLONY CONSISTED OF PROBABLY 20 PRS OF BIRDS AT HEIGHT OF BREEDING SEASON. THIS AREA MAY BE USED FOR CONSTRUCTION AS A DRAGLINE WAS PRESENT. AREA APPEARS TO BE AN ELEVATED SPOIL SITE.

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*011*SC
GRANK:
TOPOMAP: 531 - JAMES ISLAND
LAT: 324214
SOURCE: DR. FORSYTHE BIOLOGY DEPT. THE CITADEL
STATUS: ST
SRANK:
DOTNUM: 4
LONG: 795955
DATE: 76-01-01
DESC: BIRDS ATTEMPTED TO BREED AT JAMES ISLAND AIRPORT FOR THE FIRST TIME THIS YEAR AND WERE UNSUCCESSFUL. BIRDS NESTED IN THE AREA BETWEEN RUNWAYS. NO YOUNG WERE PRODUCED AND THE BIRDS LEFT THE AREA IN EARLY JUNE.

ELEMENT: OPHISAURUS COMPRESSUS / ISLAND GLASS LIZARD
EOCODE: ARACB02020*002*SC
GRANK: G4
TOPOMAP: 531 - JAMES ISLAND
LAT: 324400
SOURCE: J. P DEVEAUX CHARLESTON MUSEUM
STATUS: C2
SRANK: S1S2
DOTNUM: 5
LONG: 795215
DATE: 33-09-01
DESC: 1 SPECIMEN REPORTED ISLAND SUFFERS FROM EROSION AND IS USED AS A SPOIL SITE BY THE ARMY CORPS OF ENGINEERS. "CUMMINGS POINT ON MORRIS ISLAND."

ELEMENT: IPOMOEA STOLONIFERA / BEACH MORNING-GLORY
EOCODE: PDCON0A1G0*001*SC
GRANK: G5?
TOPOMAP: 531 - JAMES ISLAND
LAT: 324400
SOURCE: J. DENNIS
STATUS: UN
SRANK: S?
DOTNUM: 5
LONG: 795215
DATE: 74-09-01
DESC: OCCURS IN DUNE COMMUNITY ON THE NORTHERN END OF MORRIS ISLAND. SOUTHERN END OF MORRIS ISLAND IS A SPOIL AREA.

Legareville

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*014*SC
GRANK: G3G4
TOPOMAP: 530 - LEGAREVILLE
LAT: 324436
SOURCE: K. HUNT (NCU)
STATUS: C2
SRANK: S3
DOTNUM: 1
LONG: 800222
DATE: 45-04-01
DESC: REPORTED AT THE EDGE OF A MARSHY POND IN A BOGGY PINELAND, ROCKVILLE ROAD 200 YDS SW OF RIVER RD. PLOTTED 200 YDS SW OF JCT OF MAYBANK RD AND RIVER RD. WADMALAW ISLAND NE. LOCATION UNCLEAR

ELEMENT: SAGERETIA MINUTIFLORA / TINY-LEAVED BUCKTHORN
EOCODE: PDRHA0D010*017*SC
GRANK: G4
TOPOMAP: 530 - LEGAREVILLE
LAT: 323827
SOURCE: S. LEONARD
STATUS: UN
SRANK: S2
DOTNUM: 2
LONG: 800048
DATE: 83-11-01
DESC: SHELLMOUNDS JUST EAST OF JCT OF STONO RIVER AND KIAWAH RIVER. BETWEEN KIAWAH ISLAND AND SOL LEGARE ISLAND. ALSO ON SHELL MOUND JUST WEST OF JCT OF STONO AND KIAWAH RIVER JCT.

ELEMENT: NESTING AREA / CALL TOM MURPHY AT 844-2473 FOR DETAILS
EOCODE: ABNKC10010*048*SC
GRANK: G3
TOPOMAP: 530 - LEGAREVILLE
LAT: .
SOURCE: T. MURPHY #T84
DESC: MULLET HALL. ACTIVE 1990.
STATUS: FE
SRANK: S2
DOTNUM: 3
LONG: .
DATE: 90-06-25

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
EOCODE: AMAFF08011*007*SC
GRANK: G?
TOPOMAP: 530 - LEGAREVILLE
LAT: 324057
SOURCE: R.M. MEANS (CHM #39.80)
DESC: JOHNS ISLAND. ONE ANIMAL CAPTURED
STATUS: UN
SRANK: S?
DOTNUM: 4
LONG: 800037
DATE: 39-04-08

Fort Moultrie

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*014*SC
GRANK:
TOPOMAP: 517 - FORT MOULTRIE
LAT: 324521
SOURCE: D. FORSYTHE,BIOLOGY DEPT.THE CITADEL
STATUS: ST
SRANK:
DOTNUM: 1
LONG: 795104
DATE: 76-06-01
DESC: SULLIVAN'S ISLAND ROOKERY HAS EXISTED FOR 10 YEARS. COLONY NUMBERED AROUND 25 PAIRS IN THE PAST. HEAVY HUMAN DISTURBANCE AND ANIMAL PREDATION ARE PROBLEMS. RECENT DEVELOPMENT OF FORT MOULTRIE MAY INCREASE DANGERS TO THIS ROOKERY.

ELEMENT: CANNA FLACCIDA / BANDANA-OF-THE-EVERGLADES
EOCODE: PMCAN01030*005*SC
GRANK: G5?
TOPOMAP: 517 - FORT MOULTRIE
LAT: 324713
SOURCE: H. AHLES (NCU)
STATUS: UN
SRANK: S4
DOTNUM: 2
LONG: 795102
DATE: 61-07-01
DESC: LOW ROADSIDE, MAINLAND ON APPROACH TO ISLE OF PALMS. EXACT LOCATION UNCLEAR.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*029*SC
GRANK: G5
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325010
SOURCE: MURPHY AND COKER
STATUS: SC
SRANK: S4
DOTNUM: 3
LONG: 795135
DATE: 79-11-01
DESC: ACTIVE NEST REPORTED ALONG UPPER END OF HOBCAW CREEK. NEST IS ABOUT 0.4 MILES SOUTH OF S-97 (LONG POINT RD)

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*022*SC
GRANK: G3G4
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325000
SOURCE: PORCHER (CIT)
STATUS: C2
SRANK: S3
DOTNUM: 4
LONG: 794930
DATE: 78-08-01
DESC: OCCURS IN POCOSIN 1 MILE NORTH OF JCT OF US-17 AND MATHIS FERRY RD. SOUTH SIDE OF US-17 ABOUT 100' FROM ROAD EDGE. ANOTHER SPECIMEN FOUND ABOUT 200' FROM EDGE OF ROAD.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*027*SC
GRANK: G5
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325228
SOURCE: MURPHY AND COKER
STATUS: SC
SRANK: S4
DOTNUM: 5
LONG: 795017
DATE: 79-11-01
DESC: 1 ACTIVE NEST REPORTED ALONG HORLBECK CREEK AT WANDO RIVER.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*025*SC
GRANK: G5
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325220
SOURCE: MURPHY AND COKER
STATUS: SC
SRANK: S4
DOTNUM: 6
LONG: 794837
DATE: 79-11-01
DESC: 1 ACTIVE NEST REPORTED ALONG UPPER END OF HORLBECK CREEK, ABOUT 0.5 MI DOWN- STREAM FROM SC-41

ELEMENT: MARITIME FOREST
EOCODE: CTCXX00050*015*SC
GRANK: G2
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325052
SOURCE: PORCHER
STATUS: UN
SRANK: S2S3
DOTNUM: 7
LONG: 794642
DATE: 75-06-01
DESC: CANOPY SPECIES INCLUDE Q.VIRGINIANA, Q.NIGRA(15IN), PINUS TAEDA(16IN), LIQUIDAMBAR STYRACIFLUA(10 IN),AND SABAL PALMETTO(10IN). AREA IS LOCATED NEAR PORCHER'S BLUFF. RARE PLANT SAGERETIA MINUTIFLORA OCCURS HERE. SITE NAME; AULD MOUND. SEE MAP IN GEOGRAPHIC MANUAL FILE.

ELEMENT: SAGERETIA MINUTIFLORA / TINY-LEAVED BUCKTHORN
EOCODE: PDRHA0D010*001*SC
GRANK: G4
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325052
SOURCE: J. DENNIS
STATUS: UN
SRANK: S2
DOTNUM: 7
LONG: 794642
DATE: 75-06-14
DESC: OCCURS NEAR AULD MOUND AN INDIAN SHELL RING IN MIXED PINE-HARDWOODS. SEE MAP IN GEOGRAPHIC MANUAL FILE.

ELEMENT: MIDDENS
EOCODE: CTCXX00090*003*SC
GRANK: G?
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325138
SOURCE: PORCHER
STATUS: UN
SRANK: S3
DOTNUM: 8
LONG: 794526
DATE: 74-07-01
DESC: THE RIM OF THE BUZZARD'S ISLAND SUPPORTS A DENSE GROWTH OF CEDAR, OAK, AND PALMETTO. THE LOWER LEVELS CONTAIN SALICORNIA, SUAEDA, AND BORRICHIA. AN INDIAN SHELL RING IS FOUND HERE SAGERETIA MINUTIFLORA OCCURS HERE. SEE MAP IN GEOGRAPHIC MANUAL FILE.

ELEMENT: SAGERETIA MINUTIFLORA / TINY-LEAVED BUCKTHORN
EOCODE: PDRHA0D010*002*SC
GRANK: G4
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325138
SOURCE: PORCHER
STATUS: UN
SRANK: S2
DOTNUM: 8
LONG: 794526
DATE: 74-07-02
DESC: OCCURS IN THE AREA OF BUZZARDS ISLAND SHELL RING SEE MAP IN GEOGRAPHIC MAN- UAL FILE

ELEMENT: MARITIME FOREST
EOCODE: CTCXX00050*023*SC
GRANK: G2
TOPOMAP: 517 - FORT MOULTRIE
LAT: 325147
SOURCE: PORCHER
STATUS: UN
SRANK: S2S3
DOTNUM: 9
LONG: 794516
DATE: 74-07-01
DESC: MAJOR VEGETATION INCLUDES SABAL PALMETTO JUNIPERUS VIRGINICA,PERSEA BORBONIA, ILEX OPACO,AND QUERCUS LAURIFOLIA TREES ARE ABOUT 25-30 YRS. OLD. SITE NAME; CROW ISLAND. SEE MAP IN GEOGRAPHIC MAN- UAL FILE.

ELEMENT: LASIURUS CINEREUS / HOARY BAT
EOCODE: AMACC05030*002*SC
GRANK: G5
TOPOMAP: 517 - FORT MOULTRIE
LAT: 324728
SOURCE: A.T. WAYNE; HARVARD U. (MCZ #17418)
STATUS: UN
SRANK: S?
DOTNUM: 10
LONG: 795148
DATE: 18-01-14
DESC: MT. PLEASANT ONE MALE CAPTURED.

Johns Island

ELEMENT: SITE RECORD NNNEW
EOCODE: SXXXXNNNEW*487*SC
GRANK:
TOPOMAP: 515 - JOHNS ISLAND
LAT: 325217
SOURCE: JOHN DENNIS
STA
SRA
DOT
LONG: 800417
DATE: 75-06-01
DESC: VIEWED BY BOAT FROM OLD FORT DORCHESTER TO DRAYTON HALL THE ASHLEY AFFORDS AN EXCELLENT WILDLIFE HABITAT IN A RELATIVELY PRISTINE CONDITION. AREA INCLUDES HISTORIC PLANTATIONS, 1500A OF BRACKISH MARSH AND SCENIC RIVER BLUFFS. PLANT COMMUNITY MESOPHYTIC HARDWOOD. NESTING OSPREY, HERON EGRET ROOKERY PRESENT.

ELEMENT: CLEMMYS GUTTATA / SPOTTED TURTLE
EOCODE: ARAAD02010*008*SC
GRANK: G5
TOPOMAP: 515 - JOHNS ISLAND
LAT: 324802
SOURCE: P. TELLER CHARLESTON MUSEUM
STATUS: UN
SRANK: S5
DOTNUM: 1
LONG: 800602
DATE: 58-03-01
DESC: 1 SPECIMEN REPORTED FROM PLASTERS PHOSPHATE MINE AREA, 10 MILES WEST OF CHARLESTON ON US-17

ELEMENT: MUSTELA FRENATA / LONG-TAILED WEASEL
EOCODE: AMAJF02030*002*SC
GRANK: G5
TOPOMAP: 515 - JOHNS ISLAND
LAT: 324532
SOURCE: R. D. WHEELER CHARLESTON MUSEUM
STATUS: UN
SRANK: S3S4
DOTNUM: 2
LONG: 800500
DATE: 39-01-01
DESC: REPORTED ON JOHNS ISLAND, DIRECTIONS NOT GIVEN. ALSO REPORTED BY LABRUCE IN MARCH 1940. ALSO REPORTED IN JAN. AND FEB. 1936 BY WALPOLE. NO DIRECTIONS.

ELEMENT: MUSTELA FRENATA / LONG-TAILED WEASEL
EOCODE: AMAJF02030*004*SC
GRANK: G5
TOPOMAP: 515 - JOHNS ISLAND
LAT: 324943
SOURCE: R. JOHNSON QWE
STATUS: UN
SRANK: S3S4
DOTNUM: 3
LONG: 800233
DATE: 43-03-01
DESC: REPORTED AT PIERPONT.

ELEMENT: ROOKERY;HERONS AND ALLIES,FORESTED
EOCODE: ORXXX00006*017*SC
GRANK:
TOPOMAP: 515 - JOHNS ISLAND
LAT: 325224
SOURCE: JOHN DENNIS
STATUS: UN
SRANK:
DOTNUM: 4
LONG: 800522
DATE: 77-01-01
DESC: GARDEN PROVIDES NEST AREAS FOR WHITE IBIS (20-30 PRS), GREEN HERON (10-20 PRS), AND LEAST BITTERN (60-70 PRS)

ELEMENT: SPRUCE PINE-MIXED HARDWOOD FOREST
EOCODE: CTCXX00130*002*SC
GRANK: G3
TOPOMAP: 515 - JOHNS ISLAND
LAT: 325213
SOURCE: JOHN DENNIS
STATUS: UN
SRANK: S2
DOTNUM: 5
LONG: 800440
DATE: 77-03-01
DESC: THIS COMMUNITY FOUND AT THE ASHLEY RIVER COMPLEX (DRAYTON HALL, HASTIE, MAGNOLIA GARDENS) SOME PURE STANDS OF SPRUCE AND HARDWOOD ARE ALSO FOUND HERE

ELEMENT: COMMUNITY UNDEFINED
EOCODE: CXXXX00000*003*SC
GRANK: G?
TOPOMAP: 515 - JOHNS ISLAND
LAT: 325213
SOURCE: J. DENNIS
STATUS: UN
SRANK: S?
DOTNUM: 5
LONG: 800440
DATE: 75-01-01
DESC: AREA IS AN OLD PLANTATION NEAR THE ASHLEY RIVER SURROUNDED BY WOODLAND AND MARSHLAND WHICH SUPPORTS A LARGE BIRD POPULATION. DOMINANT CANOPY SPECIES INCLUDE PINUS TAEDA(DBH 1-2'), QUERCUS FALCATA(1-3'), Q. LAURIFOLIA(1-2'), Q. MICHAUXII(1-2'),MAGNOLIA GRANDIFLORA(1- 2'), AND OTHER HARDWOODS.

ELEMENT: PLECOTUS RAFINESQUII / RAFINESQUE'S BIG-EARED BAT
EOCODE: AMACC08020*022*SC
GRANK: G4
TOPOMAP: 515 - JOHNS ISLAND
LAT: 325213
SOURCE: C. DRAYTON (CHM #62.80.414-62.80.419)
STATUS: SE/C2
SRANK: S2?
DOTNUM: 5
LONG: 800440
DATE: 50-11-15
DESC: DRAYTON HALL. SIX ANIMALS CAPTURED.

ELEMENT: SPRUCE PINE-MIXED HARDWOOD FOREST
EOCODE: CTCXX00130*001*SC
GRANK: G3
TOPOMAP: 515 - JOHNS ISLAND
LAT: 325213
SOURCE: JOHN DENNIS
STATUS: UN
SRANK: S2
DOTNUM: 5
LONG: 800440
DATE: 77-03-01
DESC: THIS COMMUNITY FOUND AT THE ASHLEY RIVER COMPLEX (DRAYTON HALL, HASTIE, MAGNOLIA GARDENS). SOME PURE STANDS OF SPRUCE AND HARDWOOD ARE ALSO FOUND HERE.

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
EOCODE: AMAFF08011*011*SC
GRANK: G?
TOPOMAP: 515 - JOHNS ISLAND
LAT: 324915
SOURCE: R.H. COLEMAN (CHM #1237,1238,1230)
STATUS: UN
SRANK: S?
DOTNUM: 6
LONG: 800127
DATE: 40-01-00
DESC: ASHLEY HALL ROAD. ONE MALE AND TWO FEMALES CAPTURED.

Cainhoy

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*026*SC
GRANK: G5
TOPOMAP: 501 - CAINHOY
LAT: 325325
SOURCE: T. MURPHY AND J. COKER
DESC: WANDO RIVER. AN ACTIVE NEST NEAR POINT HOPE ISLAND.
STATUS: SC
SRANK: S4
DOTNUM: 1
LONG: 795115
DATE: 79-11-01

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*024*SC
GRANK: G5
TOPOMAP: 501 - CAINHOY
LAT: 325506
SOURCE: MURPHY AND COKER
DESC: 1 ACTIVE NEST REPORTED EAST OF SC-41, JUST SOUTH OF THE WANDO RIVER. NEAR CAINHOY.
STATUS: SC
SRANK: S4
DOTNUM: 2
LONG: 794933
DATE: 79-11-01

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
EOCODE: AAAAA01030*005*SC
GRANK: G4
TOPOMAP: 501 - CAINHOY
LAT: 325546
SOURCE: CHM CHARLESTON MUSEUM
DESC: 14 REPORTED 0.3 MILES EAST OF CAINHOY
STATUS: SC/C2
SRANK: S3
DOTNUM: 3
LONG: 794930
DATE: 53-08-01

ELEMENT: OPHIOGLOSSUM PETIOLATUM / LONGSTEM ADDER'S-TONGUE FERN
EOCODE: PPOPH02090*001*SC
GRANK: G5
TOPOMAP: 501 - CAINHOY
LAT: 325604
SOURCE: THOMAS (NCU)
DESC: LONG-STEMED ADDER'S TONGUE OCCURS ON LAWN OF WANDO BAPTIST CHURCH BESIDE S- 100, BETWEEN SC-41 AND S-33, WANDO,SC
STATUS: UN
SRANK: S?
DOTNUM: 4
LONG: 794923
DATE: 74-02-01

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
EOCODE: AAAAA01030*004*SC
GRANK: G4
TOPOMAP: 501 - CAINHOY
LAT: 325554
SOURCE: CHM CHARLESTON MUSEUM
DESC: SIX REPORTED 1 2 MILES WEST OF CAINHOY. LOCATIONS PLOTTED ON CAINHOY ROAD
STATUS: SC/C2
SRANK: S3
DOTNUM: 5
LONG: 795104
DATE: 53-10-01

ELEMENT: BURMANNIA BIFLORA / NORTHERN BURMANNIA
EOCODE: PMBUR02010*002*SC
GRANK: G4G5
TOPOMAP: 501 - CAINHOY
LAT: 325738
SOURCE: RAYNER, PHILLIPS
DESC: OCCURS IN A MOIST DEPRESSION UNDER A TRANSMISSION RIGHT-OF-WAY SOUTH OF ST THOMAS CHURCH, WEST OF S-98 COLONY OF SARRACENIA MINOR OCCURS NEARBY
STATUS: UN
SRANK: S?
DOTNUM: 6
LONG: 795135
DATE: 77-08-01

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*042*SC
GRANK: G3G4
TOPOMAP: 501 - CAINHOY
LAT: 325724
SOURCE: R. PORCHER
STATUS: C2
SRANK: S3
DOTNUM: 7
LONG: 794938
DATE: 83-10-01
DESC: LOW GROUND ON INSIDE CURVE OF OLD RR GRADE; EAST OF LOOKOUT TOWER AND WEST OF SC-41. NORTH OF CAINHOY.

ELEMENT: SEMINATRIX PYGAEA / BLACK SWAMP SNAKE
EOCODE: ARADB31010*001*SC
GRANK: G5
TOPOMAP: 501 - CAINHOY
LAT: 325742
SOURCE: L. W. BELL CHARLESTON MUSEUM
STATUS: UN
SRANK: S?
DOTNUM: 8
LONG: 794915
DATE: 52-01-01
DESC: BLACK SWAMP SNAKE. REPORTED 2 1 MILES NORTH 0.3 MILE EAST OF CAINHOY 2 SPECIMENS. 1 SPECIMEN FOUND IN 5/53 BY J. QUINBY.

ELEMENT: SARRACENIA RUBRA / SWEET PITCHER-PLANT
EOCODE: PDSAR02080*025*SC
GRANK: G3
TOPOMAP: 501 - CAINHOY
LAT: 325742
SOURCE: R. PORCHER
STATUS: UN
SRANK: S1
DOTNUM: 8
LONG: 794915
DATE: 83-10-01
DESC: OLD RAILROAD GRADE JUST WEST OF SC-41 AND SOUTH OF FOREST ROUTE 188, NORTH OF CAINHOY

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
EOCODE: AAAAA01030*002*SC
GRANK: G4
TOPOMAP: 501 - CAINHOY
LAT: 325741
SOURCE: CHM CHARLESTON MUSEUM
STATUS: SC/C2
SRANK: S3
DOTNUM: 9
LONG: 794855
DATE: 53-10-01
DESC: THREE REPORTED 2.1 MILES NORTH OF CAINHOY. LOCATIONS PLOTTED ON SC-41

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*019*SC
GRANK: G3G4
TOPOMAP: 501 - CAINHOY
LAT: 325748
SOURCE: R. PORCHER (CIT)
STATUS: C2
SRANK: S3
DOTNUM: 10
LONG: 794943
DATE: 79-08-01
DESC: SHALLOW DEPRESSION IN LONGLEAF PINELAND; GROWING IN ASSOCIATION WITH LINDERA MELISSAEFOLIUM. SOUTHSIDE OF BRICKCHURCH RD AT JCT OF BRICKCHURCH RD AND FOREST RT 189A COMPARTMENT 114 ON FS MAP TWO COLONIES NEAR THE ONE MAPPED SEE MAP IN GEOGRAPHIC MANUAL FILE

ELEMENT: LINDERA MELISSIFOLIA / PONDBERRY
EOCODE: PDLAU07020*005*SC
GRANK: G2
TOPOMAP: 501 - CAINHOY
LAT: 325748
SOURCE: PORCHER (CIT)
STATUS: FE
SRANK: S1
DOTNUM: 10
LONG: 794943
DATE: 79-08-01
DESC: FOUND IN SHALLOW DEPRESSION IN LONGLEAF PINELAND ON SOUTH SIDE OF BRICK CHURCH ROAD. AT JCT OF BRICK CH RD AND FS RT 189A AN ADDITIONAL COLONY NEAR THE ONE MAPPED SEE MAP IN GEOGRAPHIC MANUAL FILE.

ELEMENT: SARRACENIA RUBRA / SWEET PITCHER-PLANT
EOCODE: PDSAR02080*018*SC
GRANK: G3
TOPOMAP: 501 - CAINHOY
LAT: 325802
SOURCE: R. PORCHER (CIT)
STATUS: UN
SRANK: S1
DOTNUM: 11
LONG: 794928
DATE: 79-06-01
DESC: FOUND IN LOW DEPRESSION IN PINELAND IN ASSOCIATION WITH S. MINOR. NE OF JCT OF FS ROUTE 189A AND 188. EXACT LOCATION UNKNOWN.

ELEMENT: SARRACENIA RUBRA / SWEET PITCHER-PLANT
EOCODE: PDSAR02080*026*SC
GRANK: G3
TOPOMAP: 501 - CAINHOY
LAT: 325804
SOURCE: R. PORCHER
STATUS: UN
SRANK: S1
DOTNUM: 12
LONG: 794856
DATE: 83-10-01
DESC: SOUTHEAST CORNER OF JCT OF SC-41 AND FOREST ROUTE 188, NORTH OF CAINHOY.

ELEMENT: SCHWALBEA AMERICANA / CHAFFSEED
EOCODE: PDSCR1Q010*017*SC
GRANK: G2
TOPOMAP: 501 - CAINHOY
LAT: 325757
SOURCE: RICHARD PORCHER
STATUS: NC/PE
SRANK: S2
DOTNUM: 13
LONG: 794856
DATE: 81-07-27
DESC: 1.9 MI N OF JCT OF SC-41 AND CAINHOY RD ON EAST SIDE OF SC-41 (OR 0.2 MI S. OF JCT OF BRICK CHURCH RD. & SC-41).

ELEMENT: PTEROGLOSSASPIS ECRISTATA / CRESTED FRINGED ORCHID
EOCODE: PMORC27010*010*SC
GRANK: G3G4
TOPOMAP: 501 - CAINHOY
LAT: 325753
SOURCE: PORCHER - CITADEL
STATUS: C2
SRANK: S2
DOTNUM: 14
LONG: 794856
DATE: 73-08-01
DESC: PINEWOODS ALONG SC-41, 1.8 MILES NORTH OF JCT OF 41 AND S-100.

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*040*SC
GRANK: G3G4
TOPOMAP: 501 - CAINHOY
LAT: 325800
SOURCE: R. PORCHER
STATUS: C2
SRANK: S3
DOTNUM: 15
LONG: 794836
DATE: 83-10-01
DESC: AT LEAST TWO SITES IN LOW GROUND AT OLD RR GRADE, JUST S. JUST N. OF FOREST RT. 188 (HOOVER RD) AND E OF SC-41, N. OF CAINHOY SITE NAME: HOOVER RD. SPICEBUSH POND/BOG. SEE MAP IN GEOGRAPHIC MANUAL FILE.

ELEMENT: RANA AREOLATA
EOCODE: AAABH01010*004*SC
GRANK: G4
TOPOMAP: 501 - CAINHOY
LAT: 325818
SOURCE: W. SEYLE , R. MOULIS
STATUS: SC
SRANK: S?
DOTNUM: 16
LONG: 794840
DATE: 87-03-12
DESC: GOPHER FROGS, IDENTIFIED BY VOCALIZATIONS, CALLING IN CYPRESS POND ON FRANCIS MARION NF OFF FOREST SERVICE ROAD 183, 2.85 MILES NNE OF CAINHOY

ELEMENT: LINDERA MELISSIFOLIA / PONDBERRY
EOCODE: PDLAU07020*010*SC
GRANK: G2
TOPOMAP: 501 - CAINHOY
LAT: 325818
SOURCE: R. PORCHER #2001 (CIT)
STATUS: FE
SRANK: S1
DOTNUM: 16
LONG: 794840
DATE: 82-05-27
DESC: POND CYPRESS-SWAMP TUPELO POND ON NORTH SIDE OF HOOVER RD., 0.3 MILES EAST OF JCT OF HOOVER RD AND SC-41. ROBUST COLONY, PRESENT GROWTH DEVELOPED AFTER FIRE KILLED IT LAST SEASON.

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*041*SC
GRANK: G3G4
TOPOMAP: 501 - CAINHOY
LAT: 325835
SOURCE: R. PORCHER
STATUS: C2
SRANK: S3
DOTNUM: 17
LONG: 794742
DATE: 83-10-01
DESC: SLIGHTLY LESS THAN 1 MI EAST OF FOREST ROUTE 188. SITE IS AT LOW GROUND AT OLD RR GRADE NORTH OF CAINHOY.

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
EOCODE: AAAAA01030*003*SC
GRANK: G4
TOPOMAP: 501 - CAINHOY
LAT: 325840
SOURCE: CHM CHARLESTON MUSEUM
STATUS: SC/C2
SRANK: S3
DOTNUM: 18
LONG: 794856
DATE: 53-10-01
DESC: ONE REPORTED 3.2 MILES NORTH OF CAINHOY. LOCATIONS PLOTTED ON SC-41.

ELEMENT: AMBYSTOMA TIGRINUM TIGRINUM / EASTERN TIGER SALAMANDER
EOCODE: AAAAA01146*002*SC
GRANK: G5T5
TOPOMAP: 501 - CAINHOY
LAT: 325920
SOURCE: J.R. HARRISON, COLLEGE OF CHARLESTON
STATUS: SC
SRANK: S2S3
DOTNUM: 19
LONG: 794855
DATE: 64-11-24
DESC: 4.4 MILES NORTH OF CAINHOY. SEE BULL. S.C. ACAD. SCI. 28:34. 1966.

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
EOCODE: PDLAU08010*021*SC
GRANK: G3G4
TOPOMAP: 501 - CAINHOY
LAT: 325955
SOURCE: R. PORCHER (CIT)
STATUS: C2
SRANK: S3
DOTNUM: 20
LONG: 794852
DATE: 79-09-01
DESC: OCCURS IN DEPRESSION IN LONGLEAF PINES OPPOSITE INTERSECTION OF SC-41 AND FOREST SERVICE RT 229

ELEMENT: SCHWALBEA AMERICANA / CHAFFSEED
EOCODE: PDSCR1Q010*007*SC
GRANK: G2
TOPOMAP: 501 - CAINHOY
LAT: 325955
SOURCE: D. RAYNER (VER)
STATUS: NC/PE
SRANK: S2
DOTNUM: 21
LONG: 794840
DATE: 85-06-01
DESC: GROWING IN SANDY LONGLEAF PINE ON FOREST SERVICE RT 229, 0 2 MI FROM JCT WITH SC-41 BORDERS COMPARTMENTS 101 AND 196 63 PLANTS SEEN. REPORTED BY R.D PORCHER 05/02/79

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
EOCODE: AAAAA01030*010*SC
STATUS: SC/C2
GRANK: G4
SRANK: S3
TOPOMAP: 501 - CAINHOY
DOTNUM: 22
LAT: 325827
LONG: 794822
SOURCE: W. SEYLE , R. MOULIS
DATE: 87-03-13
DESC: THREE LARVAE NETTED FROM OPEN REEDY-GRASSY POND IN FRANCIS MARION NF OFF FOREST SERVICE ROAD 183, 3.95 MILES NNE OF CAINHOY. (2 LARVAE TO S.C. STATE MUSEUM, 1 TO SAVANNAH SCIENCE MUSEUM.)

North Charleston

ELEMENT: COMMUNITY UNDEFINED
EOCODE: CXXXX00000*002*SC
GRANK: G?
TOPOMAP: 500 - NORTH CHARLESTON
LAT: 325747
SOURCE: R. PORCHER
STATUS: UN
SRANK: S?
DOTNUM: 1
LONG: 795304
DATE: 74-08-01
DESC: FLAGG CREEK IS A RELATIVELY UNDISTURBED TIDAL CREEK FLOWING INTO THE COOPER RIVER, WITH MAGNOLIA AND LIQUIDAMBAR AS DOMINANT TREES. ALSO NUMEROUS OTHER TREES, SHRUBS, AND HERBS. IN GENERAL AREA OF MAPPED LOCATION.

ELEMENT: NERODIA FLORIDANA / FLORIDA GREEN WATER SNAKE
EOCODE: ARADB22080*002*SC
GRANK: G5
TOPOMAP: 500 - NORTH CHARLESTON
LAT: 325914
SOURCE: TOM KRAUS
STATUS: UN
SRANK: S2
DOTNUM: 2
LONG: 795604
DATE: 80-05-08
DESC: MARRINGTON PLANTATION, NAVAL WEAPONS STATION, OFF OF RED BANK ROAD.

ELEMENT: NERODIA FLORIDANA / FLORIDA GREEN WATER SNAKE
EOCODE: ARADB22080*003*SC
GRANK: G5
TOPOMAP: 500 - NORTH CHARLESTON
LAT: 325914
SOURCE: FRED AND TOM KRAUS
STATUS: UN
SRANK: S2
DOTNUM: 3
LONG: 795604
DATE: 82-08-06
DESC: ON BUSHY PARK ROAD, 2 MI NE OF RED BANK ROAD, IN VICINITY OF MARRINGTON PLANTATION. ANIMAL WAS ON THE ROAD AT NIGHT

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*068*SC
GRANK: G5
TOPOMAP: 500 - NORTH CHARLESTON
LAT: 325826
SOURCE: MURPHY AND COKER
STATUS: SC
SRANK: S4
DOTNUM: 3
LONG: 795725
DATE: 79-11-01
DESC: THREE ACTIVE NESTS OCCURRING NEAR MANNINGTON PLANTATION. ON HIGHWAY MAP WESTVACO IS REPORTED OWNER.

ELEMENT: NESTING AREA / CALL TOM MURPHY AT 844-2473 FOR DETAILS
EOCODE: ABNKC10010*024*SC
GRANK: G3
TOPOMAP: 500 - NORTH CHARLESTON
LAT: .
SOURCE: T MURPHY #T83
STATUS: FE
SRANK: S2
DOTNUM: 4
LONG:
DATE: 90-06-25
DESC: FOSTER CREEK BETWEEN FOSTER CREEK AND BACK RIVER, ON BIG ISLAND. ACTIVE 1990.

Ladson

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*003*SC
GRANK:
TOPOMAP: 499 - LADSON
LAT: 325610
SOURCE: DR. FORSYTHE,BIOLOGY DEPT.THE CITADEL
STATUS: ST
SRANK:
DOTNUM: 1
LONG: 800218
DATE: 76-07-01
DESC: BIRDS HAVE BEEN NESTING HERE SINCE 1974 ON THE GRAVEL TOP ROOF. THIS YEAR 8 PAIR PRODUCED 13 YOUNG. THIS WAS THE FIRST CASE OF LEAST TERNS BREEDING ON A ROOFTOP IN S.C. IN FLORIDA BIRDS HAVE DONE THIS SINCE 1957. MAPPED AT LOCATION INDICATED ON OLD TOPO. BIRDS ALSO NESTING ON NEARBY K-MART ROOF.

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
EOCODE: AMAFF08011*002*SC
GRANK: G?
TOPOMAP: 499 - LADSON
LAT: 325832
SOURCE: R.H. COLEMAN (CHM #271)
STATUS: UN
SRANK: S?
DOTNUM: 2
LONG: 800213
DATE: 29-01-00
DESC: GOOSE CREEK CHURCH. ONE FEMALE CAPTURED.

ELEMENT: SEMINATRIX PYGAEA / BLACK SWAMP SNAKE
EOCODE: ARADB31010*002*SC
GRANK: G5
TOPOMAP: 499 - LADSON
LAT: 325832
SOURCE: R. E. POWELL CHARLESTON MUSEUM
STATUS: UN
SRANK: S?
DOTNUM: 2
LONG: 800213
DATE: 56-03-01
DESC: REPORTED AT GOOSE CREEK. GENERAL LOCATION

ELEMENT: LUCANIA GOODEI / BLUEFIN KILLIFISH
EOCODE: AFCNB07010*004*SC
GRANK: G5
TOPOMAP: 499 - LADSON
LAT: 325927
SOURCE: H. LOYACANO
STATUS: UN
SRANK: S1?
DOTNUM: 3
LONG: 800004
DATE: 74-07-09
DESC: ONE MALE COLLECTED FROM FOSTER CREEK 4.5 MILES ESE OF GOOSE CREEK.

ELEMENT: PLATANTHERA INTEGRA / YELLOW FRINGELESS ORCHID
EOCODE: PMORC1Y0C0*013*SC
GRANK: G3G4
TOPOMAP: 499 - LADSON
LAT: 325909
SOURCE: R. SMITH (CIT)
STATUS: UN
SRANK: S2
DOTNUM: 4
LONG: 800440
DATE: 72-09-01
DESC: EDGE OF SWAMP THAT CROSSES I-26 SOUTH OF THE BERKELEY-CHARLESTON COUNTY LINE, EAST SIDE OF THE ROAD.

ELEMENT: SCHWALBEA AMERICANA / CHAFFSEED
EOCODE: PDSCR1Q010*001*SC
GRANK: G2
TOPOMAP: 499 - LADSON
LAT: 325626
SOURCE: AHLES & J.G HAESLOOP (NCU)
STATUS: NC/PE
SRANK: S2
DOTNUM: 5
LONG: 800238
DATE: 57-05-20
DESC: CHAFF-SEED REPORTED IN SAVANNAH-LIKE GRASSY AREA, 4 MILE NW OF JCT OF S-75 AND US-78 (SW OF NORTH CHARLESTON) PROBABLY EXTIRPATED AS OF 6/85

ELEMENT: NESTING AREA / CALL TOM MURPHY AT 844-2473 FOR DETAILS
EOCODE: ABNKC10010*027*SC
GRANK: G3
TOPOMAP: 499 - LADSON
LAT: .
SOURCE: T. MURPHY #T62
DESC: GOOSE CREEK. EAST SIDE OF GOOSE CREEK RESERVOIR. ACTIVE 1990.

STATUS: FE
SRANK: S2
DOTNUM: 6
LONG: .
DATE: 90-06-25

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
EOCODE: AMAFF08011*014*SC
GRANK: G?
TOPOMAP: 499 - LADSON
LAT: 325730
SOURCE: E.B. CHAMBERLAIN (CHM #2763,2764)
DESC: OTRANTO. TWO ANIMALS CAPTURED.

STATUS: UN
SRANK: S?
DOTNUM: 7
LONG: 800213
DATE: 26-04-00

ELEMENT: AMARANTHUS PUMILUS / SEABEACH PIGWEED
EOCODE: PDAMA040Z0*003*SC
GRANK: G2
TOPOMAP: 518 - CAPERS INLET
LAT: 324800
SOURCE: R. K. GODFREY (NCSC)
STATUS: NC/C2
SRANK: S1
DOTNUM: 1
LONG: 794445
DATE: 50-01-01
DESC: FREQUENT ALONG THE EDGES OF DUNES AT THE ISLE OF PALMS, JUST AT HIGH TIDE LEVEL.

ELEMENT: MARITIME FOREST
EOCODE: CTCXX00050*014*SC
GRANK: G2
TOPOMAP: 518 - CAPERS INLET
LAT: 324828
SOURCE: DENNIS
STATUS: UN
SRANK: S2S3
DOTNUM: 2
LONG: 794354
DATE: 74-01-01
DESC: OCCURS ON THE ISLE OF PALMS A COASTAL BARRIER ISLAND APPROX. 6 MILES LONG. CANOPY INCLUDES QUERCUS VIRGINIANA(DBH 3'), PINUS TAEDA(1-2'), AND SABAL PALMETTO. OENOTHERA DRUMMONDII REPORTEDLY OCCURS HERE. MUCH OF THE ISLAND IS BUILT-UP WITH DEVELOPMENT SPREADING NORTHWARD.

ELEMENT: MARITIME FOREST
EOCODE: CTCXX00050*005*SC
GRANK: G2
TOPOMAP: 518 - CAPERS INLET
LAT: 325025
SOURCE: J. DENNIS
STATUS: UN
SRANK: S2S3
DOTNUM: 3
LONG: 794245
DATE: 75-01-01
DESC: SITE IS LOCATED NORTH OF ISLE OF PALMS. DEWEES IS ONE OF FEW UNDEVELOPED ISLANDS ALONG THE S.C. COAST. TYPICAL LIVE OAK- PALMETTO ASSOCIATION. NO DBH INFORMATION GIVEN IN REPORT THIS ISLAND MAY BE DEVELOPED IN THE NEAR FUTURE.

ELEMENT: ROOKERY;LEAST TERN
EOCODE: ORXXX00010*027*SC
GRANK:
TOPOMAP: 518 - CAPERS INLET
LAT: 325105
SOURCE: S. THOMPSON
STATUS: ST
SRANK:
DOTNUM: 4
LONG: 794245
DATE: 79-06-01
DESC: COLONY LOCATED AT NORTH END OF DEWEES ISLAND. 4 ADULTS, 2 NESTS.

ELEMENT: CARETTA CARETTA / LOGGERHEAD TURTLE
EOCODE: ARAAA01010*009*SC
GRANK: G3
TOPOMAP: 518 - CAPERS INLET
LAT: 324948
SOURCE: TALBERT-BARUCH INSTITUTE
STATUS: FT
SRANK: S3
DOTNUM: 5
LONG: 794245
DATE: 77-01-01
DESC: < 50 NESTS REPORTED. MOST NESTING OCCURRED FROM MID-JULY THROUGH AUGUST. DEWEES MAY BE DEVELOPED IN THE NEAR FUTURE.

ELEMENT: PANDION HALIAETUS / OSPREY
EOCODE: ABNKC01010*004*SC
GRANK: G5
TOPOMAP: 518 - CAPERS INLET
LAT: 325200
SOURCE: T. MURPHY
STATUS: SC
SRANK: S4
DOTNUM: 6
LONG: 794100
DATE: 79-11-01
DESC: ACTIVE NEST WITH CHICKS REPORTED. ISLAND MAY HAVE MORE NESTS NOT ACTIVE IN 1979.

ELEMENT: MARITIME FOREST
EOCODE: CTCXX00050*004*SC
GRANK: G2
TOPOMAP: 518 - CAPERS INLET
LAT: 325200
SOURCE: J. DENNIS
DESC: MARITIME FOREST ON CAPERS ISLAND.

STATUS: UN
SRANK: S2S3
DOTNUM: 6
LONG: 794100
DATE: 75-01-01

ELEMENT: ALLIGATOR MISSISSIPPIENSIS / AMERICAN ALLIGATOR
EOCODE: ARABA01010*004*SC
GRANK: G5
TOPOMAP: 518 - CAPERS INLET
LAT: 325200
SOURCE: HTP STAFF
DESC: REPORTED ON CAPERS ISLAND.

STATUS: FT(S/A)
SRANK: S5
DOTNUM: 6
LONG: 794100
DATE: 76-01-01

ELEMENT: CARETTA CARETTA / LOGGERHEAD TURTLE
EOCODE: ARAAA01010*010*SC
GRANK: G3
TOPOMAP: 518 - CAPERS INLET
LAT: 325211
SOURCE: TALBERT-BARUCH INSTITUTE
DESC: LESS THAN 25 NESTS REPORTED FROM MAY- AUGUST. BEACH EROSION AND RELATIVE CLOSENESS TO CHARLESTON (LESS THAN 20 MILES) MAY BE LIMITING FACTORS.

STATUS: FT
SRANK: S3
DOTNUM: 7
LONG: 793945
DATE: 77-01-01

ELEMENT: ACIPENSER BREVIROSTRUM / SHORTNOSE STURGEON
EOCODE: AFCAA01010*012*SC
GRANK: G3
TOPOMAP: 518 - CAPERS INLET
LAT: 325224
SOURCE: MARCHETTE
DESC: CAUGHT IN GILLNET BY MARCHETTE. IN ATLANTIC OCEAN NEAR CAPE ROMAIN AT PRICES INLET. ONE SPECIMEN.

STATUS: FE
SRANK: S3S4
DOTNUM: 8
LONG: 793905
DATE: 80-02-01

ELEMENT: HALIAEETUS LEUCOCEPHALUS / BALD EAGLE
EOCODE: ABNKC10010*047*SC
GRANK: G3
TOPOMAP: 518 - CAPERS INLET
LAT: .
SOURCE: T. MURPHY #T27
DESC: DEWEE'S ISLAND (EGG RECORD 1901).

STATUS: FE
SRANK: S2
DOTNUM: 9
LONG: .
DATE: 90-06-25

CHARLESTON COUNTY

ELEMENT: BOTRYCHIUM LUNARIOIDES / WINTER GRAPE-FERN
ELCODE: PPOPH01090 **STATUS:** UN
GRANK: G4? **SRANK:** S?

ELEMENT: PSILOTUM NUDUM / WHISK FERN
ELCODE: PPPSI01020 **STATUS:** SL
GRANK: G5 **SRANK:** S1S2

ELEMENT: LYGODIUM PALMATUM / CLIMBING FERN
ELCODE: PPSCH02030 **STATUS:** SL
GRANK: G4 **SRANK:** S1S2

ELEMENT: PELTANDRA SAGITTIFOLIA / SPOON-FLOWER
ELCODE: PMARA0E020 **STATUS:** UN
GRANK: G3G4 **SRANK:** S?

ELEMENT: CANNA FLACCIDA / BANDANA-OF-THE-EVERGLADES
ELCODE: PMCAN01030 **STATUS:** UN
GRANK: G5? **SRANK:** S4

ELEMENT: CAREX DECOMPOSITA / EPIPHYTIC SEDGE
ELCODE: PMCYP033K0 **STATUS:** UN
GRANK: G3G4 **SRANK:** S?

ELEMENT: CYPERUS TETRAGONUS / PIEDMONT FLATSEDGE
ELCODE: PMCYP063H0 **STATUS:** SL
GRANK: G4? **SRANK:** S1

ELEMENT: ELEOCHARIS VIVIPARA / VIVIPAROUS SPIKE-RUSH
ELCODE: PMCYP091Y0 **STATUS:** UN
GRANK: G5 **SRANK:** S?

ELEMENT: SCLERIA BALDWINII / BALDWIN NUTRUSH
ELCODE: PMCYP0R010 **STATUS:** SL
GRANK: G3G4 **SRANK:** S1S2

ELEMENT: SYNGONANTHUS FLAVIDULUS / YELLOW PIPEWORT
ELCODE: PMERI03010 **STATUS:** UN
GRANK: G5 **SRANK:** SH

ELEMENT: THALIA DEALBATA / POWDERY THALIA
ELCODE: PMMAR03010 **STATUS:** UN
GRANK: G3G5 **SRANK:** S?

ELEMENT: CALOPOGON BARBATUS / BEARDED GRASS-PINK
ELCODE: PMORC0C010 **STATUS:** UN
GRANK: G5? **SRANK:** S?

ELEMENT: HABENARIA QUINQUESETA / LONG-HORN ORCHID
ELCODE: PMORC1A070 **STATUS:** UN
GRANK: G4G5 **SRANK:** S?

ELEMENT: LISTERA AUSTRALIS / SOUTHERN TWAYBLADE
ELCODE: PMORC1N020 **STATUS:** UN
GRANK: G4 **SRANK:** S?

ELEMENT: PLATANTHERA INTEGRA / YELLOW FRINGELESS ORCHID
ELCODE: PMORC1Y0C0 **STATUS:** UN
GRANK: G3G4 **SRANK:** S2

ELEMENT: PTEROGLOSSASPIS ECRISTATA / CRESTED FRINGED ORCHID
ELCODE: PMORC27010 **STATUS:** C2
GRANK: G3G4 **SRANK:** S2

ELEMENT: SPIRANTHES LACINIATA / LACE-LIP LADIES'-TRESSES
ELCODE: PMORC2B0E0 **STATUS:** UN
GRANK: G4G5 **SRANK:** S1

ELEMENT: TRIPHORA TRIANTHOPHORA / NODDING POGONIA
ELCODE: PMORC2F050 **STATUS:** SL
GRANK: G4 **SRANK:** S2

ELEMENT: ANTHAENANTIA RUFA / PURPLE SILKYSCALE
ELCODE: PMPOA0D010 **STATUS:** UN
GRANK: G5 **SRANK:** S?

ELEMENT: CHASMANTHIUM NITIDUM / SHINY SPIKEGRASS
ELCODE: PMPOA1D030 **STATUS:** UN
GRANK: G3? **SRANK:** S?

ELEMENT: DYSCHORISTE HUMISTRATA / SWAMP DYSCHORISTE
ELCODE: PDACA09040 **STATUS:** UN
GRANK: G4G5 **SRANK:** S?

ELEMENT: AMARANTHUS PUMILUS / SEABEACH PIGWEED
ELCODE: PDAMA040Z0 **STATUS:** NC/C2
GRANK: G2 **SRANK:** S1

ELEMENT: ASCLEPIAS PEDICELLATA / SAVANNAH MILKWEED
ELCODE: PDASC021E0 **STATUS:** RC
GRANK: G3G4 **SRANK:** S1

ELEMENT: LOBELIA BOYKINII / BOYKIN'S LOBELIA
ELCODE: PDCAM0E050 **STATUS:** C2
GRANK: G2 **SRANK:** S?

ELEMENT: IPOMOEA STOLONIFERA / BEACH MORNING-GLORY
ELCODE: PDCON0A1G0 **STATUS:** UN
GRANK: G5? **SRANK:** S?

ELEMENT: DIONAEA MUSCIPULA / VENUS' FLY-TRAP
ELCODE: PDDRO01010 **STATUS:** RC
GRANK: G3 **SRANK:** S1

ELEMENT: MONOTROPSIS ODORATA / SWEET PINESAP
ELCODE: PDERI0V010 **STATUS:** RC
GRANK: G3 **SRANK:** S1

ELEMENT: PIERIS PHYLLYREIFOLIA / CLIMBING FETTER-BUSH
ELCODE: PDERI10020 **STATUS:** SL
GRANK: G3? **SRANK:** S?

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
ELCODE: PDLAU08010 **STATUS:** C2
GRANK: G3G4 **SRANK:** S3

ELEMENT: OROBANCHE UNIFLORA / NAKED BROOMRAPE
ELCODE: PDORO040F0 **STATUS:** UN
GRANK: G5 **SRANK:** S?

ELEMENT: SAGERETIA MINUTIFLORA / TINY-LEAVED BUCKTHORN
ELCODE: PDRHA0D010 **STATUS:** UN
GRANK: G4 **SRANK:** S2

ELEMENT: AGRIMONIA INCISA / INCISED GROOVEBUR
ELCODE: PDROS03040 **STATUS:** NC/C2
GRANK: G3 **SRANK:** S1

ELEMENT: SARRACENIA RUBRA / SWEET PITCHER-PLANT
ELCODE: PDSAR02080 **STATUS:** UN
GRANK: G3 **SRANK:** S1

ELEMENT: LEPUROPETALON SPATHULATUM / SOUTHERN LEPUROPETALON
ELCODE: PDSAX0L010 **STATUS:** UN
GRANK: G5? **SRANK:** S?

ELEMENT: SCHISANDRA GLABRA / BAY STARVINE
ELCODE: PDSCH01020 **STATUS:** SX
GRANK: G4 **SRANK:** SX

ELEMENT: SCHWALBEA AMERICANA / CHAFFSEED
ELCODE: PDSCR1Q010 **STATUS:** NC/PE
GRANK: G2 **SRANK:** S2

ELEMENT: ACIPENSER BREVIROSTRUM / SHORTNOSE STURGEON
ELCODE: AFCAA01010 **STATUS:** FE
GRANK: G3 **SRANK:** S3S4

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
ELCODE: AAAAA01030 **STATUS:** SC/C2
GRANK: G4 **SRANK:** S3

ELEMENT: AMBYSTOMA TIGRINUM TIGRINUM / EASTERN TIGER SALAMANDER
ELCODE: AAAAA01146 **STATUS:** SC
GRANK: G5T5 **SRANK:** S2S3

ELEMENT: PSEUDOBRANCHUS STRIATUS STRIATUS / BROAD-STRIPED DWARF SIREN
ELCODE: AAAAG01015 **STATUS:** SC
GRANK: G5T? **SRANK:** S2

ELEMENT: ACRIS CREPITANS CREPITANS / NORTHERN CRICKET FROG
ELCODE: AAABC01012 **STATUS:** UN
GRANK: G5T5 **SRANK:** S5

ELEMENT: RANA AREOLATA
ELCODE: AAABH01010 **STATUS:** SC
GRANK: G4 **SRANK:** S?

ELEMENT: CARETTA CARETTA / LOGGERHEAD TURTLE
ELCODE: ARAAA01010 **STATUS:** FT
GRANK: G3 **SRANK:** S3

ELEMENT: CLEMMYS GUTTATA / SPOTTED TURTLE
ELCODE: ARAAD02010 **STATUS:** UN
GRANK: G5 **SRANK:** S5

ELEMENT: ALLIGATOR MISSISSIPPIENSIS / AMERICAN ALLIGATOR
ELCODE: ARABA01010 **STATUS:** FT(S/A)
GRANK: G5 **SRANK:** S5

ELEMENT: OPHISAURUS COMPRESSUS / ISLAND GLASS LIZARD
ELCODE: ARACB02020 **STATUS:** C2
GRANK: G4 **SRANK:** S1S2

ELEMENT: MICRURUS FULVIUS / EASTERN CORAL SNAKE
ELCODE: ARADC02010 **STATUS:** UN
GRANK: G5 **SRANK:** S2

ELEMENT: PELECANUS OCCIDENTALIS / BROWN PELICAN
ELCODE: ABNFC01020 **STATUS:** SC
GRANK: G5 **SRANK:** S1S2

ELEMENT: MYCTERIA AMERICANA / WOOD STORK
ELCODE: ABNGF02010 **STATUS:** FE
GRANK: G5 **SRANK:** S1S2

ELEMENT: PANDION HALIAETUS / OSPREY
ELCODE: ABNKC01010 **STATUS:** SC
GRANK: G5 **SRANK:** S4

ELEMENT: ELANOIDES FORFICATUS / AMERICAN SWALLOW-TAILED KITE
ELCODE: ABNKC04010 **STATUS:** SE
GRANK: G5 **SRANK:** S2

ELEMENT: ICTINIA MISSISSIPPIENSIS / MISSISSIPPI KITE
ELCODE: ABNKC09010 **STATUS:** UN
GRANK: G5 **SRANK:** S4

ELEMENT: TYTO ALBA / BARN-OWL
ELCODE: ABNSA01010 **STATUS:** UN
GRANK: G5 **SRANK:** S4

ELEMENT: PICOIDES BOREALIS / RED-COCKADED WOODPECKER
ELCODE: ABNYF07060 **STATUS:** FE
GRANK: G2 **SRANK:** S2

ELEMENT: VERMIVORA BACHMANII / BACHMAN'S WARBLER
ELCODE: ABPBX01010 **STATUS:** FE
GRANK: G1 **SRANK:** SX

ELEMENT: DENDROICA VIRENS / BLACK-THROATED GREEN WARBLER
ELCODE: ABPBX03100 **STATUS:** UN
GRANK: G5 **SRANK:** S4

ELEMENT: LIMNOTHLYPIS SWAINSONII / SWAINSON'S WARBLER
ELCODE: ABPBX09010 **STATUS:** UN
GRANK: G4 **SRANK:** S4

ELEMENT: AIMOPHILA AESTIVALIS / BACHMAN'S SPARROW
ELCODE: ABPBX91050 **STATUS:** C2
GRANK: G3 **SRANK:** S3S4

ELEMENT: MYOTIS AUSTRORIPARIUS / SOUTHEASTERN MYOTIS
ELCODE: AMACC01030 **STATUS:** C2
GRANK: G4 **SRANK:** S2S3

ELEMENT: LASIURUS CINEREUS / HOARY BAT
ELCODE: AMACC05030 **STATUS:** UN
GRANK: G5 **SRANK:** S?

ELEMENT: PLECOTUS RAFINESQUII / RAFINESQUE'S BIG-EARED BAT
ELCODE: AMACC08020 **STATUS:** SE/C2
GRANK: G4 **SRANK:** S2?

ELEMENT: SCIURUS NIGER / FOX SQUIRREL
ELCODE: AMAFB07040 **STATUS:** UN
GRANK: G5 **SRANK:** S4

ELEMENT: NEOTOMA FLORIDANA / EASTERN WOODRAT
ELCODE: AMAFF08010 **STATUS:** UN
GRANK: G5 **SRANK:** S3S4

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
ELCODE: AMAFF08011 **STATUS:** UN
GRANK: G? **SRANK:** S?

ELEMENT: MICROTUS PENNSYLVANICUS / MEADOW VOLE
ELCODE: AMAFF11010 **STATUS:** SC
GRANK: G5 **SRANK:** S4

ELEMENT: URSUS AMERICANUS / BLACK BEAR
ELCODE: AMAJB01010 **STATUS:** SC
GRANK: G5 **SRANK:** S3?

ELEMENT: MUSTELA FRENATA / LONG-TAILED WEASEL
ELCODE: AMAJF02030 **STATUS:** UN
GRANK: G5 **SRANK:** S3S4

ELEMENT: INTERTIDAL BEACH
ELCODE: CMCXX00020 **STATUS:** UN
GRANK: G5 **SRANK:** S3

ELEMENT: BALD CYPRESS-TUPELO GUM SWAMP
ELCODE: CPPCX00010 **STATUS:** UN
GRANK: G5 **SRANK:** S4

ELEMENT: POCOSIN
ELCODE: CPSCX00040 **STATUS:** UN
GRANK: G3G4 **SRANK:** S3S4

ELEMENT: MARITIME FOREST
ELCODE: CTCXX00050 **STATUS:** UN
GRANK: G2 **SRANK:** S2S3

ELEMENT: MARITIME SHRUB THICKET
ELCODE: CTCXX00070 **STATUS:** UN
GRANK: G4 **SRANK:** S2S3

ELEMENT: MIDDENS
ELCODE: CTCXX00090 **STATUS:** UN
GRANK: G? **SRANK:** S3

ELEMENT: SPRUCE PINE-MIXED HARDWOOD FOREST
ELCODE: CTCXX00130 **STATUS:** UN
GRANK: G3 **SRANK:** S2

ELEMENT: MESIC MIXED HARDWOOD FOREST
ELCODE: CTPCX00010 **STATUS:** UN
GRANK: G5 **SRANK:** S4

ELEMENT: COMMUNITY UNDEFINED
ELCODE: CXXXX00000 **STATUS:** UN
GRANK: G? **SRANK:** S?

ELEMENT: CAROLINA BAY
ELCODE: OBPROPOSED **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: ROOKERY,OCEAN BIRDS,HERONS AND ALLIES
ELCODE: ORXXX00004 **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: ROOKERY;HERONS AND ALLIES,NON-FORESTED
ELCODE: ORXXX00005 **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: ROOKERY;HERONS AND ALLIES,FORESTED
ELCODE: ORXXX00006 **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: ROOKERY;LEAST TERN
ELCODE: ORXXX00010 **STATUS:** ST
GRANK: **SRANK:**

ELEMENT: ROOKERY;SHOREBIRDS
ELCODE: ORXXX00R01 **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: ROOKERY;MIXED OCEAN AND SHORE BIRDS
ELCODE: ORXXX00R02 **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: SITE RECORD NNAPP
ELCODE: SXXXXNNAPP **STATUS:** UN
GRANK: **SRANK:**

ELEMENT: SITE RECORD NNNEW
ELCODE: SXXXXNNNEW **STATUS:** UN
GRANK: **SRANK:**

RECORD OF ☐ VISIT ☑ CONFERENCE OR ☐ TELEPHONE CALL

TIME: 10:00 am

DATE: 6/5/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION

Bill Book, John Sneed
Charleston Naval Base

COPIES TO:

SUBJECT: Site Visit and Information Gathering

FILE:

DIGEST

I was taken on a tour of a closer look at SWMUs 8 and 9 and asked for further information about SWMU 25.

For SWMU #8 I noticed a drainage ditch very close to the area of significant oil spillage. This ditch appeared permanent since it had a lot of aquatic plants growing in it. An egret was also noted in the ditch. Mr. Book could not confirm that this ditch lead directly into the Cooper River or Shipyard Creek. In the area of SWMU 9 I noticed many marshes and tidally influenced areas. There was a lot of wetland plants and birds in the area.

Again Mr. Sneed stated that he knew of no release from SWMU 25 into the environment. I was concerned about possible releases from SWMU 25 as wastewater may have flowed into SWMU 22. Mr. Sneed only knew of contamination beneath the building.

CONCLUSION, ACTION TAKEN, OR REQUIRED

Mr. Book gave me information stating that there are 22,371 people who live or work on base. Mr. Book said the estimate given by the public relations department was high because it includes sailors out at sea and off base housing. This number will be used in the HRS scoring.

DATE: 6/5/92

ORIGINATOR: P. Cell/Aaron

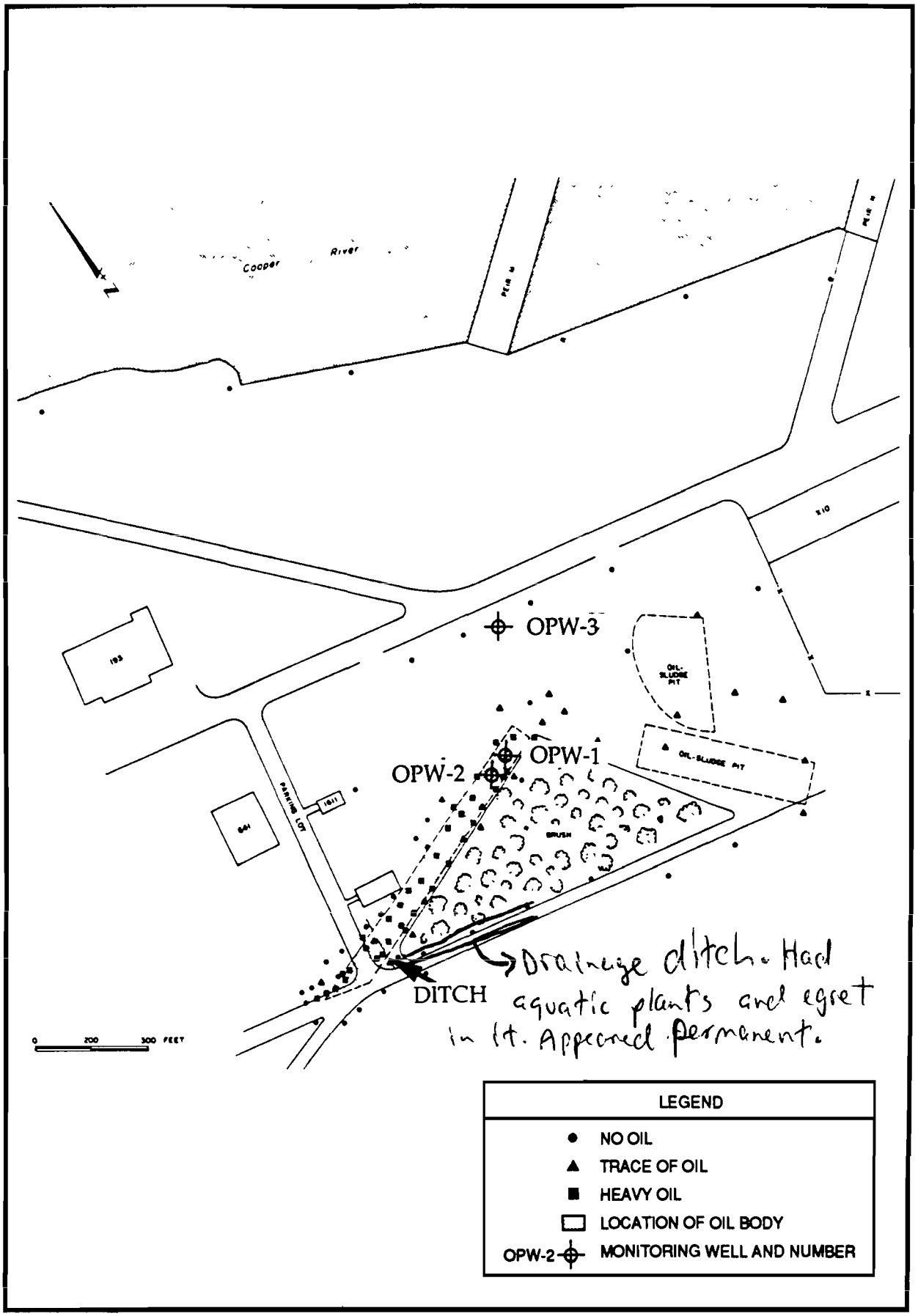


Figure 2-18. SWMU #8 Monitoring well and boring locations. (Figure taken from Reference 12.)

U.S. DEPARTMENT OF COMMERCE
LUTHER H. HODGES, Secretary

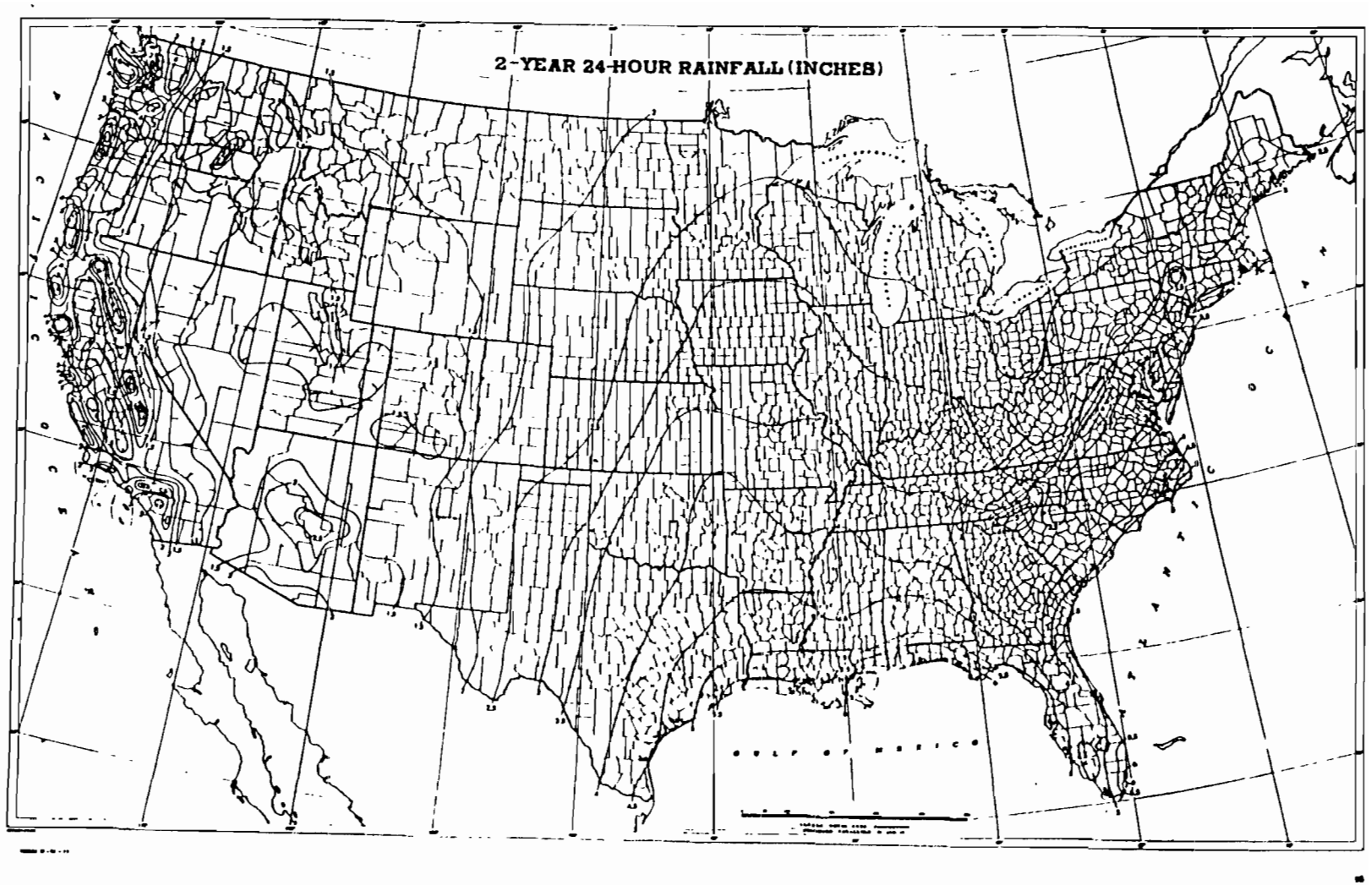
WEATHER BUREAU
F. W. REICHELDERFER, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture


2-YEAR 24-HOUR RAINFALL (INCHES)

RECORD OF ☐ VISIT ☑ CONFERENCE OR ☐ TELEPHONE CALL | TIME: 2:00pm | DATE: 6/4/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION

Ms. Brenda Hockensmith
Senior Hydrologist
South Carolina Water Resources Commission

COPIES TO:

SUBJECT: Public and Private Water Supply In Area of Charleston Naval Base

FILE:

DIGEST

ms. Hockensmith gave me several printouts showing public and private groundwater supply sources within a 7-mile distance of well SCWRC number 18CC-r01 which is located on the premises of the Charleston Naval Base.

The list given is extensive and she questioned the accuracy of it. She stated that any well located in Charleston or North Charleston is not used for drinking. All are on public water. She also stated that in the City or Town of Mt. Pleasant, or Sullivan's Island any well shallower than 1500 ft. is unused. She also stated that Medical University wells are only for emergency use, Goose Creek wells are unused, and that Shadowmoss is used for irrigation only. She also stated that she doubts any drinking water wells are used east of the Ashley River.

The drinking water wells are designated as "WS". ms. Hockensmith was not concerned with the other designations. She also stated that the Cooper marl is an excellent confining unit between the surficial and Santee Limestone aq

CONCLUSION, ACTION TAKEN, OR REQUIRED

Because the surficial aquifer is the only aquifer considered drinking water sources will not be evaluated. There are no drinking water resources found which tap the surficial aquifer within a 4-mile distance of the Naval Base. There are wells for irrigational uses.

DATE: 6/5/92 | ORIGINATOR: P. CL Mason

18CC-w01	CHN-0610	1.47	325009	795713	MacAlloy Corp.
18CC-y01	CHN-0150	2.20	325044	795948	Jenkins Orphanage
18DD-b01	CHN-0136	2.50	324918	795657	Exxon Co USA
18DD-b02	CHN-0582	2.14	324940	795650	W.R. Grace Co.
18DD-b03	CHN-0583	2.14	324940	795650	W.R. Grace Co.
18DD-c01	CHN-0137	2.31	324927	795702	Exxon Co USA
18DD-i01	CHN-0013	3.91	324808	795635	City of Charleston
18DD-k01	CHN-0009	5.35	324701	795555	City of Charleston
18DD-k02	CHN-0064	5.18	324709	795559	City of Charleston
18DD-k03	CHN-0014	4.93	324728	795543	SC Electic & Gas
18DD-l01	CHN-0011	5.11	324709	795612	City of Charleston
18DD-l02	CHN-0012	4.15	324758	795623	City of Charleston
18DD-l03	CHN-0178	5.07	324703	795655	Medical University
18DD-p01	CHN-0295	5.99	324623	795912	Coburg Dairy Inc
18DD-q01	CHN-0141	6.13	324607	795814	City of Charleston
18DD-q02	CHN-0310	6.06	324614	795843	R M Gillivray
18DD-t01	CHN-0008	5.71	324643	795550	City of Charleston
18DD-x01	CHN-0612	6.63	324541	795806	Chas Country Club
18DD-y01	CHN-0475	6.65	324549	795918	
19BB-w01	CHN-0213	6.44	325503	800232	James King
19BB-w02	CHN-0296	6.51	325512	800228	Midland Park School
19BB-w03	CHN-0297	6.16	325510	800200	Hughes Motor Lines
19CC-f01	CHN-0118	6.80	325320	800411	Southern Bell Teleph
19CC-n01	CHN-0503	6.16	325219	800350	Mike Crombie
19CC-u01	CHN-0107	2.86	325023	800021	Bird & Son
19CC-u02	CHN-0108	2.78	325025	800017	Bird & Son
19CC-x01	CHN-0172	6.13	325049	800353	Shadowmoss Dvlt Corp
19DD-g01	CHN-0019	6.94	324808	800337	US Dpt of Agricultur
19DD-i01	CHN-0146	5.04	324820	800121	Wallace School
19DD-l01	CHN-0472	6.19	324718	800145	Triangle Lanes
22EE-a01	CHN-0121	0.05	325120	795744	Helen Bradham

SCWRC	County#	Class-A	Howfar	Lat	Long	Owner
18CC-r01	CHN-0017		0.00	325121	795741	U S Naval Shipyard
17CC-fo2	BRK-0295		4.07	325302	795404	Guggeheim Plantation
17CC-k02	BRK-0296		2.53	325208	795517	
17CC-o01	BRK-0293		3.12	325228	795448	Guggenheim
17CC-o02	BRK-0295		4.07	325302	795404	Guggeheim Plantation
17CC-p01	BRK-0289		2.98	325109	795440	Guggeheim Foundation
17CC-p03	BRK-0290		2.86	325129	795447	Guggenheim Foundatio
17CC-p04	BRK-0292		3.33	325126	795418	Guggeheim Foundation
17CC-v01	CHN-0140		6.51	325030	795109	Georgia Pacific
17CC-w01	CHN-0542		5.16	325012	795237	SC State Ports Auth
17CC-y01	BRK-0284		3.53	325038	795412	Guggenheim Foundatio
17CC-y02	BRK-0285		3.44	325037	795418	Guggenheim Foundatn
17CC-y03	BRK-0286		3.27	325038	795428	Guggeheim Foundation
17CC-y04	BRK-0287		3.16	325055	795431	Johnson
17DD-a01	DHN-0284		6.98	324925	795058	Alva M Heath
17DD-a02	CHN-0285		6.98	324925	795058	Alva M Heath
17DD-b01	CHN-0116		6.65	324931	795117	CR Deytens
17DD-b02	CHN-0287		6.67	324933	795115	CR Deytens
17DD-d01	CHN-0115		4.41	324917	795356	Hobcaw Yacht Club
17DD-d02	CHN-0288		5.00	324919	795313	Hobcaw Constrctn Co
17DD-d03	CHN-0541		4.59	324948	795324	SC State Ports Auth
17DD-f01	CHN-0289		4.45	324853	795414	Longshoreman Asso'n
17DD-f02	CHN-0290		4.44	324851	795417	Harold Edmonson
17DD-f03	CHN-0291		4.50	324853	795410	Fred C Brown
17DD-g01	CHN-0091		5.41	324826	795325	City of Mt Pleasant
17DD-g02	CHN-0094		5.45	324821	795326	City of Mt Pleasant
17DD-g03	CHN-0093		5.51	324822	795321	City of Mt Pleasant
17DD-g04	CHN-0095		5.42	324822	795328	City of Mt Pleasant
17DD-g05	CHN-0092		5.44	324825	795323	City of Mt Pleasant
17DD-g06	CHN-0292		5.30	324836	795324	GrtrHoly Trty AME Ch
17DD-g07	CHN-0167		5.30	324829	795330	City of Mt Pleasant
17DD-g08	CHN-0152		5.32	324829	795329	City of Mt Pleasant
17DD-g09	CHN-0087		5.30	324829	795330	Town of Mt Pleasant
17DD-g10	CHN-0090		5.34	324829	795327	Town of Mt Pleasant
17DD-g11	CHN-0086		5.34	324828	795328	Town of Mt Pleasant
17DD-g12	CHN-0089		5.35	324825	795330	Town of Mt Pleasant
17DD-g13	CHN-0088		5.35	324824	795331	Town of Mt Pleasant
17DD-g14	CHN-0509		5.27	324829	795333	Town of Mt Pleasant
17DD-g15	CHN-0510		5.27	324828	795334	Town of Mt Pleasant
17DD-g16	CHN-0511		5.29	324825	795335	Town of Mt Pleasant
17DD-m08	CHN-0084		7.00	324726	795218	Town of Mt Pleasant
17DD-m10	CHN-0083		6.90	324725	795227	Town of Mt Pleasant
17DD-m13	CHN-0375		6.68	324725	795245	Glenwood Garden Ctr
17DD-m14	CHN-0544		6.34	324740	795257	CM Stefanou
17DD-m15	CHN-0545		6.34	324741	795256	CM Steanou
17DD-q06	CHN-0292		5.30	324836	795324	Grtr Holy Trtny AME
18CC-e01	CHN-0294		3.68	325413	795915	Westvaco Paper Mill
18CC-g01	CHN-0049		2.28	325308	795838	Raybestos-Manhatten
18CC-g02	CHN-0540		3.02	325354	795813	Wesvaco Inc
18CC-i01	BRK-0297	N	2.82	325321	795604	George Deyten
18CC-k01	BRK-0273		2.14	325226	795556	M.B. Burns
18CC-k02	BRK-0296		2.53	325208	795517	
18CC-o01	CHN-0460		2.42	325254	795919	Viola Bunn
18CC-q01	CHN-0476		0.65	325143	795811	US Naval Shipyard
18CC-r01	CHN-0017		0.00	325121	795741	U S Naval Shipyard
18CC-v01	CHN-0607		1.52	325015	795651	MacAlloy Corp

Record#	scwrc	drdpth	comdpth	elev	wtruse	yield	cons	wq	gl	pt	wl
1185	17CC-fo2			13.00	LS		X				
1184	17CC-k02			5.00	DO						
875	17CC-o01	72	72	10.00		-1			Y		
1186	17CC-o02			13.00	LS		X				
1190	17CC-p01			15.00			X				
1191	17CC-p03	391	391	9.00	DO	80	X		X		
1192	17CC-p04			10.00	LS						
35	17CC-t01	365	328	9.00	WS	100	Y	Y	Y		
876	17CC-v01	315	315	-1.00	UN	50	Y				Y
879	17CC-w01	-1	-1	21.00	DO	-1					
1187	17CC-y01		82	10.00	AB		X		X		
878	17CC-y02	82	82	10.00	AB	-1			Y		
1188	17CC-y03			10.00	DO		X				
1189	17CC-y04			10.00							
935	17DD-a01	20	20	15.00	DO	-1	Y				
883	17DD-a02	20	20	15.00		-1	Y				
882	17DD-a03	415	-1	15.00	OT	-1	Y	Y	Y		
507	17DD-a04	2282	1980	15.00	WS	626	Y	Y	Y		
918	17DD-a06	2222	1960	20.00	PS	-1	X	Y	X	X	X
917	17DD-b01	-1	350	20.00	UN	-1	Y				Y
916	17DD-b02	-1	-1	15.00	DO	-1					
915	17DD-d01	-1	-1	10.00	OT	-1	Y	Y			
881	17DD-d02	-1	-1	15.00	UN	-1					
914	17DD-d03	-1	-1	-1.00		-1			Y		
36	17DD-f01	344	344	6.00	UN	-1			Y		Y
913	17DD-f02	-1	-1	10.00	DO	-1					
912	17DD-f03	-1	30	15.00		-1					
508	17DD-g01	65	39	20.00	WS	75	Y	Y		Y	Y
509	17DD-g02	65	45	20.00	WS	50	Y	Y		Y	Y
510	17DD-g03	65	45	20.00	WS	70	Y	Y		Y	Y
512	17DD-g04	65	44	20.00		70	Y	Y		Y	Y
511	17DD-g05	65	39	20.00	WS	69	Y	Y		Y	Y
911	17DD-g06	-1	26	20.00	UN	-1					Y
513	17DD-g07	2039	1993	24.00	DO	-1	Y	Y	Y	Y	Y
514	17DD-g08	515	-1	24.00	UN	-1	Y	Y	Y	Y	Y
910	17DD-g09	60	60	24.00	WS	50			X	X	X
909	17DD-g10	120	55	22.00	WS	40	Y		Y	Y	Y
908	17DD-g11	60	48	22.00		-1	Y		Y	Y	Y
907	17DD-g12	48	45	22.00	WS	150	Y		Y	Y	Y
906	17DD-g13	50	43	22.00	WS	75	Y		Y	Y	Y
903	17DD-g14	-1	-1	22.00		-1					
904	17DD-g15	-1	-1	22.00		-1					
905	17DD-g16	-1	-1	22.00		-1					
902	17DD-j01	-1	350	18.00		-1			Y		
901	17DD-m01	-1	-1	10.00	AB	-1					
900	17DD-m02	-1	-1	10.00		-1					
899	17DD-m03	-1	45	13.00	WS	-1	Y				
898	17DD-m04	-1	40	13.00	WS	50	Y				
515	17DD-m05	2292	1919	26.00	WS	-1	Y	Y	Y	Y	
897	17DD-m06	142	50	20.00	WS	-1	Y		Y	Y	Y
896	17DD-m07	62	50	10.00	WS	175	Y		Y	Y	Y
895	17DD-m08	66	42	25.00	WS	40	Y		Y	Y	Y
894	17DD-m09	68	65	25.00	WS	160	Y		Y	Y	Y
893	17DD-m10	77	66	10.00	WS	-1	Y		Y	Y	Y
892	17DD-m11	-1	-1	10.00	OT	-1		Y			
877	17DD-m12	-1	440	10.00	AB	-1					
891	17DD-m13	15	15	5.00	OT	-1	Y	Y			
890	17DD-m14	30	28	-1.00	IR	-1	Y	Y			

889	17DD-m15	20	-1	-1.00	IR	-1	Y	Y				
888	17DD-q06	26	-1	20.00	UN	-1						Y
887	17DD-r01	-1	-1	12.00	UN	-1						
886	17DD-r02	-1	58	10.00	WS	-1	Y		Y			
885	17DD-r03	48	-1	10.00	TH	-1	Y		Y			
884	17DD-r05	-1	30	10.00	UN	-1			Y			
933	17DD-r06	-1	-1	15.00		-1						
1027	17DD-s01	-1	-1	15.00		-1						
1028	17DD-s02	-1	-1	15.00		-1						
1029	17DD-s03	-1	-1	15.00		-1						
37	17DD-u01	1920	1920	5.00	WS	-1	Y	Y				
492	17DD-u02	2090	2030	5.00	WS	95	Y	Y				Y
1030	17DD-u03	326	322	5.00	UN	-1	Y		Y			
1170	17DD-u04		20		PS		X					
1171	17DD-u05		20		PS		X					
1172	17DD-u06		20		PS		X					
38	17DD-u07	1950	1950	5.00	PS	-1	X	Y	Y	X	X	
934	17DD-v01	1238	1238	5.00	AB	-1	Y	Y				
1150	18CC-d01											
936	18CC-e01	361	361	40.00	RE	-1	Y			Y	Y	
39	18CC-g01	515	440	30.00	IN	310	Y	Y	Y	Y		
937	18CC-g02	450	450	15.00	IN	80	Y	Y				
1104	18CC-i01	341	341	25.00	IN		X	N	X	N	N	
530	18CC-k01	-1	15	5.00		-1		Y				
1146	18CC-k02			5.00								
40	18CC-o01	325	325	30.00	UN	73	Y		Y	Y	Y	
493	18CC-q01	315	-1	20.00	IN	-1			Y		Y	
516	18CC-r01	2136	2016	12.00		-1	X		X			
938	18CC-v01	402	402	12.00	IN	310	Y	Y	Y	Y	Y	
1074	18CC-w01	440	399	10.00	IN	-1	X		X	X	X	
939	18CC-y01	400	400	25.00	UN	-1	Y					
518	18DD-b01	596	596	15.00	UN	251	X		X	X	X	
1173	18DD-b02		240		IN	300						
1174	18DD-b03		220		IN	250						
519	18DD-c01	573	510	15.00	OB	-1	Y			Y	Y	
940	18DD-i01	2000	2000	10.00		-1						
941	18DD-k01	1260	1260	-1.00	WS	-1		Y				
942	18DD-k02	1435	1435	10.00	UN	-1	Y	Y				
943	18DD-k03	2000	2000	-1.00	UN	420	Y	Y	X		Y	
944	18DD-l01	1970	1970	10.00	WS	-1		Y				
945	18DD-l02	1945	1945	10.00	RE	-1		Y				
946	18DD-l03	2078	2078	-1.00	UN	-1	Y		Y			
947	18DD-p01	400	400	5.00	AB	-1	Y					
41	18DD-q01	350	-1	10.00		-1			Y	Y	Y	
948	18DD-q02	350	350	10.00	UN	-1						
949	18DD-t01	-1	-1	10.00		-1						
494	18DD-x01	570	413	5.00		-1	X		X			
1148	18DD-y01			12.00	AB							
638	19BB-b01	-1	-1	30.00	UN	-1	Y					
639	19BB-b02	-1	-1	25.00	UN	-1	Y					
1096	19BB-c01	322	322	41.00	UN		X		X			
640	19BB-c02	323	323	42.00	UN	-1	Y					
641	19BB-c03	310	310	40.00	UN	-1	Y		Y			
1033	19BB-f01	365	365	25.00	UN	-1	Y					
1034	19BB-m01	325	325	28.00	DO	17	Y	Y				
1015	19BB-w01	-1	300	45.00	DO	-1	Y		Y		Y	
1035	19BB-w02	359	359	40.00	UN	40	Y		Y	Y	Y	
1036	19BB-w03	365	365	40.00	IN	115	Y	Y		Y	Y	
1037	19BB-w04	321	321	30.00	LS	0	Y					
1038	19CC-d01	1002	1002	45.00	AB	-1	Y					

1039	19CC-f01	353	353	25.00	AB	-1	Y					Y
1040	19CC-n01	380	380	-1.00	DO	12	Y					
1041	19CC-u01	450	450	8.00	IN	-1	Y	Y	Y			
1042	19CC-u02	452	452	13.00	IN	-1	Y	Y				
495	19CC-x01	1852	1840	13.00	DO	-1	Y	Y	Y	Y	Y	
43	19CC-y01	421	398	10.00		-1	Y	Y	Y	Y		

Record#	scwrc	owner	address	city
1185	17CC-fo2	Guggeheim Plantation		
1184	17CC-k02			
875	17CC-o01	Guggenheim		
1186	17CC-o02	Guggeheim Plantation		N. Chaarlesto
1190	17CC-p01	Guggeheim Foundation		Charleston
1191	17CC-p03	Guggenheim Foundatio		Charleston
1192	17CC-p04	Guggeheim Foundation	Offcainhoy Rd Daniel Is	Charleston
35	17CC-t01	Chn Cty P R T	Palmetto Island Cty Park	Mt Pleasant
876	17CC-v01	Georgia Pacific		
879	17CC-w01	SC State Ports Auth	Long Point Rd, Wando term	Mt Pleasant
1187	17CC-y01	Guggenheim Foundatio		
878	17CC-y02	Guggenheim Foundatn		
1188	17CC-y03	Guggeheim Foundation		Charleston
1189	17CC-y04	Johnson		Charleston
935	17DD-a01	Alva M Heath	1503 Mathis Ferry Rd	Mt Pleasant
883	17DD-a02	Alva M Heath	1503 Mathis Ferry Rd	Mt Pleasant
882	17DD-a03	Alva M Heath	1503 Mathis Ferry Rd	Mt Pleasant
507	17DD-a04	Bull's Bay Devlpt Co	1081 Hwy 17 Bypass,Box 96	Mt Pleasant
918	17DD-a06	Town of Mt Pleasant		
917	17DD-b01	CR Deytens	Box 218	Mt Pleasant
916	17DD-b02	CR Deytens	Box 218	Mt Pleasant
915	17DD-d01	Hobcaw Yacht Club	38 Formosa	Charleston
881	17DD-d02	Hobcaw Constrctn Co		
914	17DD-d03	SC State Ports Auth	Wando terminal	Mt Pleasant
36	17DD-f01	Longshoreman Asso'n	514 East Bay St.	Charleston
913	17DD-f02	Harold Edmonson		Mt Pleasant
912	17DD-f03	Fred C Brown	111 3rd Ave	Mt Pleasant
508	17DD-g01	City of Mt Pleasant		Mt Pleasant
509	17DD-g02	City of Mt Pleasant		Mt Pleasant
510	17DD-g03	City of Mt Pleasant		Mt Pleasant
512	17DD-g04	City of Mt Pleasant		Mt Pleasant
511	17DD-g05	City of Mt Pleasant		Mt Pleasant
911	17DD-g06	GrtrHoly Trty AME Ch		Mt Pleasant
513	17DD-g07	City of Mt Pleasant		Mt Pleasant
514	17DD-g08	City of Mt Pleasant		Mt Pleasant
910	17DD-g09	Town of Mt Pleasant		
909	17DD-g10	Town of Mt Pleasant		
908	17DD-g11	Town of Mt Pleasant		
907	17DD-g12	Town of Mt Pleasant		
906	17DD-g13	Town of Mt Pleasant		
903	17DD-g14	Town of Mt Pleasant		
904	17DD-g15	Town of Mt Pleasant		
905	17DD-g16	Town of Mt Pleasant		
902	17DD-j01	Sam Causey		Mt Pleasant
901	17DD-m01	Town of Mt Pleasant	211 Pitt St	Mt Pleasant
900	17DD-m02	Town of Mt Pleasant	211 Pitt St	Mt Pleasant
899	17DD-m03	Town of Mt Pleasant		
898	17DD-m04	Town of Mt Pleasant		
515	17DD-m05	City of Mt Pleasant		Mt Pleasant
897	17DD-m06	Mt Pl Wtr & Swr Comm	Simmons & King St	
896	17DD-m07	Town of Mt Pleasant		
895	17DD-m08	Town of Mt Pleasant		
894	17DD-m09	Town of Mt Pleasant		
893	17DD-m10	Town of Mt Pleasant		
892	17DD-m11	Joe Holloway	204 Pitt St	Mt Pleasant
877	17DD-m12	Unknown	204 Pitt St (@ Morrison)	Mt Pleasant
891	17DD-m13	Glenwood Garden Ctr	215 Coleman Blvd	Mt Pleasant
890	17DD-m14	CM Stefanou	510 Pelzer Dr	Mt Pleasant

889	17DD-m15	CM Steanou	510 Pelzer Dr	Mt Pleasant
888	17DD-q06	Grtr Holy Trtny AME		Mt Pleasant
887	17DD-r01	Town of Mt Pleasant		
886	17DD-r02	Town of Mt Pleasant		
885	17DD-r03	Town of Mt Pleasant		
884	17DD-r05	Town of Mt Pleasant		
933	17DD-r06	City of Mt Pleasant		
1027	17DD-s01	City of Mt Pleasant		
1028	17DD-s02	City of Mt Pleasant		
1029	17DD-s03	City of Mt Pleasant		
37	17DD-u01	Town of Sullivans Is	P O Box 427	Sullivans Is
492	17DD-u02	Town of Sullivans Is	PO Box 427	Sullivans Is
1030	17DD-u03	Town of Sullivans Is		
1170	17DD-u04	Twn of Sullivan's Is		Sullivan's Is
1171	17DD-u05	Twn of Sullivan's Is		Sullivan's Is
1172	17DD-u06	Twn of Sullivan's Is		Sullivan's Is
38	17DD-u07	Town of Sullivans Is	P O Box 427	Sullivans Is
934	17DD-v01	Nat'l Park Service	PO Drawer R	Sullivans Isld
1150	18CC-d01			
936	18CC-e01	Westvaco Paper Mill	Remount Rd	N Charleston
39	18CC-g01	Raybestos-Manhatten	SC PO Bx 5205 O'Hear Ave	N Charleston
937	18CC-g02	Wesvaco Inc	Wesvaco	
1104	18CC-i01	George Deyten	Rt. 1 Box 2	Charleston
530	18CC-k01	M.B. Burns	Box 75	Wando
1146	18CC-k02			
40	18CC-o01	Viola Bunn	4731 Park Place West	N Charleston
493	18CC-q01	US Naval Shipyard		
516	18CC-r01	U S Naval Shipyard		North Charlest
938	18CC-v01	MacAlloy Corp	Box 130	Charleston
1074	18CC-w01	MacAlloy Corp.	P.O. Box 130	Charleston
939	18CC-y01	Jenkins Orphanage	PO Box 4456 Char.Heights	Charleston
518	18DD-b01	Exxon Co USA	Greenleaf St	Charleston
1173	18DD-b02	W.R. Grace Co.		Mt. Pleasant
1174	18DD-b03	W.R. Grace Co.		Mt. Pleasant
519	18DD-c01	Exxon Co USA	Greenleaf St	Charleston
940	18DD-i01	City of Charleston	14 George St	Charleston
941	18DD-k01	City of Charleston	14 George St	Charleston
942	18DD-k02	City of Charleston	14 George St	Charleston
943	18DD-k03	SC Electic & Gas		Charleston
944	18DD-l01	City of Charleston	14 George St	Charleston
945	18DD-l02	City of Charleston	14 Gearge St	Charleston
946	18DD-l03	Medical University	80 Barre St	Charleston
947	18DD-p01	Coburg Dairy Inc	Coburg Rd	Charleston
41	18DD-q01	City of Charleston	14 George St.	Charleston
948	18DD-q02	R M Gillivray	38 Formosa Drive	Charleston
949	18DD-t01	City of Charleston	14 George St	Charleston
494	18DD-x01	Chas Country Club		
1148	18DD-y01			
638	19BB-b01	Town of Goose Creek		
639	19BB-b02	Town of Goose Creek		
1096	19BB-c01	Town of Goose Creek		
640	19BB-c02	Town of Goose Creek		
641	19BB-c03	Town of Goose Creek	PO Box 236	Goose Creek
1033	19BB-f01	Baptist College		Charleston
1034	19BB-m01	Southern Bell Teleph	8741	N Charleston
1015	19BB-w01	James King	2446 Raymond Avenue	N Charleston
1035	19BB-w02	Midland Park School	Charleston Heights	Chas Heights
1036	19BB-w03	Hughes Motor Lines	6819 Rivers Ave	N Charleston
1037	19BB-w04	Tom Youmans	2200 Dunlap St	Char. Heights
1038	19CC-d01	VirgPolytecInst&St U		Blacksburg

1039	19CC-f01	Southern Bell Teleph	Lambs Telephone Exchange	
1040	19CC-n01	Mike Crombie	5874 Ryan Bluff	N Charleston
1041	19CC-u01	Bird & Son	PO BOx 4336	Chas Heights
1042	19CC-u02	Bird & Son	PO Box 4336	Chas Heights
495	19CC-x01	Shadowmoss Dvlt Corp	Shadowmoss	Charleston
43	19CC-y01	Shadowmoss Ctry Club	Hwy 61 C	Charleston

Record#	scwrc	contact	phone	zip
1185	17CC-fo2			
1184	17CC-k02			
875	17CC-o01	Farm		
1186	17CC-o02			
1190	17CC-p01			
1191	17CC-p03			
1192	17CC-p04			
35	17CC-t01	E M Seabrook	803-884-4496	
876	17CC-v01		803-554-8191	
879	17CC-w01	Mr Setzler	803-577-8165	
1187	17CC-y01			
878	17CC-y02			
1188	17CC-y03			
1189	17CC-y04			
935	17DD-a01		803-884-9460	
883	17DD-a02		803-884-9460	29464
882	17DD-a03		803-884-9460	29464
507	17DD-a04	EM Seabrook, Jr	803-884-4496	29464
918	17DD-a06		884-9626	
917	17DD-b01		803-884-9041	
916	17DD-b02		803-884-9041	
915	17DD-d01	RM McGillivray	803-766-0471	29407
881	17DD-d02		803-884-8814	
914	17DD-d03			
36	17DD-f01	Walter Bankhead	803-723-2774	
913	17DD-f02		803-884-9334	
912	17DD-f03			29464
508	17DD-g01			29464
509	17DD-g02			29464
510	17DD-g03			29464
512	17DD-g04			29464
511	17DD-g05			29464
911	17DD-g06			
513	17DD-g07			29464
514	17DD-g08	Mr. Venning		29464
910	17DD-g09			
909	17DD-g10			
908	17DD-g11			
907	17DD-g12			
906	17DD-g13			
903	17DD-g14			
904	17DD-g15			
905	17DD-g16			
902	17DD-j01		803-884-3448	
901	17DD-m01	CB Venning		29464
900	17DD-m02	CB Venning		29464
899	17DD-m03			
898	17DD-m04			
515	17DD-m05			29464
897	17DD-m06			
896	17DD-m07			
895	17DD-m08			
894	17DD-m09			
893	17DD-m10			
892	17DD-m11		804-884-4170	29464
877	17DD-m12	Joe Holloway	803-884-4170	
891	17DD-m13		803-884-8010	29464
890	17DD-m14		803-884-1853	29464

889	17DD-m15		803-884-1853	29464
888	17DD-q06	Church		
887	17DD-r01	R Bycroft		
886	17DD-r02			
885	17DD-r03			
884	17DD-r05			
933	17DD-r06			
1027	17DD-s01			
1028	17DD-s02			
1029	17DD-s03			
37	17DD-u01			29482
492	17DD-u02		803-883-3198	29482
1030	17DD-u03			
1170	17DD-u04			
1171	17DD-u05			
1172	17DD-u06			
38	17DD-u07		883-3198	29482
934	17DD-v01	John Tucker	803-883-3123	29482
1150	18CC-d01			
936	18CC-e01	Athletic Club		
39	18CC-g01	Mr Hay	803-744-6261	29406
937	18CC-g02	Mr Terry Tsurutiss	803-554-8350	
1104	18CC-i01	Same		
530	18CC-k01			
1146	18CC-k02			
40	18CC-o01	or James L Bunn	803-744-6751	
493	18CC-q01	Norman Moore	803-743-3135	
516	18CC-r01			
938	18CC-v01	Wm R Schneider	803-722-8355	29402
1074	18CC-w01	William Schneider	803-722-8355	29402
939	18CC-y01	A R Blake-dir.	803-744-2429	29405
518	18DD-b01	Maintenance Dept	803-723-4200	
1173	18DD-b02			
1174	18DD-b03			
519	18DD-c01	Maintenance Dept	803-723-4200	
940	18DD-i01		803-723-9411	29401
941	18DD-k01		803-723-0411	29526
942	18DD-k02		803-723-0411	29401
943	18DD-k03		803-723-6641	
944	18DD-l01		803-723-9411	29401
945	18DD-l02		803-723-0411	29401
946	18DD-l03			
947	18DD-p01	Perry Clark	803-556-4870	
41	18DD-q01	John Bettis	803-723-9411	
948	18DD-q02		803-766-0471	29407
949	18DD-t01			
494	18DD-x01	Tony Brown	803-795-0846	
1148	18DD-y01			
638	19BB-b01			
639	19BB-b02			
1096	19BB-c01			
640	19BB-c02			
641	19BB-c03			
1033	19BB-f01			
1034	19BB-m01			29405
1015	19BB-w01		803-797-6958	
1035	19BB-w02			
1036	19BB-w03		803-553-6410	
1037	19BB-w04		803-553-1872	
1038	19CC-d01		703-961-5096	24061

1039	19CC-f01		803-552-3022
1040	19CC-n01		803-552-7540
1041	19CC-u01	Mr Huffman	803-744-7451 29405
1042	19CC-u02	Mr Huffman	803-744-7451 26405
495	19CC-x01		
43	19CC-y01		

RECORD OF ☐ VISIT ☑ CONFERENCE OR ☐ TELEPHONE CALL

TIME: 1:00 pm

DATE: 6/3/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION: John Sneed, Bill Book, Glen Lawhon, Todd Daniels, Robert Lipscomb, Chuck Mason

COPIES TO:

SUBJECT: Information on the Charleston Naval Base

FILE:

DIGEST

I was given information on the number of workers located on or within 200 ft. of all SWMU's considered so far in the HRS scoring.

The only SWMUs of consideration are #1 and #2 since they are accessible to workers. The others are either fenced, locked, or greater than 2 feet below ground so as not to be considered in the HRS scoring for the soil exposure pathway.

Mr. Sneed stated that SWMU #25 (Plating operation) has always had a treatment operation and that he does not know of any contaminants or outfalls that could lead into contact with the environment. The outfall was reportedly treated and then went into the sanitary sewer. All solid wastes were reportedly taken to a landfill off-base. Only contamination known is below the building.

Mr. Book said that he does not know of any residents or students located on or within 200 ft. of any SWMU.

CONCLUSION, ACTION TAKEN, OR REQUIRED

The new information concerning workers exposed will be included in the HRS scoring. Based on Mr. Sneed's statements and lack of data contaminant releases from SWMU 25 will not be considered.

DATE: 6/4/92

ORIGINATOR: CCL Mason

18 May 92

HAZARD RANKING SYSTEM
Re-evaluation of Various Solid Waste Management Units (SWMU)

1. The following is a list of various SWMU's and the facilities located within a 200 ft radius of each site as requested by EnSafe:

a. SWMU #1 is the Defense Reutilization and Marketing Office (DRMO) staging area. The facilities within the stated boundaries are bldgs 1606, 1607, 1608A, 1608B, 1605, 1627, 1640, and the Environmental Office trailer. 24

b. SWMU #2 is the lead contamination area (salvage bin #3 and adjacent paved ground). The buildings listed for SWMU #1 encompass SWMU #2. < 10

c. SWMU #5 is the battery electrolyte treatment area. The facilities within the stated boundaries are bldg 1278, bldgs 1388, 374, 182 (all three are dredge maintenance facilities), rail car unloading facility, Naval Station Security trailer, dry dock #4 (including barge), bldg 96 (dry dock shed), bldg 68 (battery shop). < 10 fenced area, people go in there 1 day a week.

d. SWMU #6 is the Public Works Storage Yard (old corral area). The facilities within the stated boundaries are bldg 3902, bldg 380 (Public Works Pier Utilities), bldg 183 (Cold Storage), Navy Exchange Canteen (operated by one person). < 10

e. SWMU #7 is the PCB Transformer Storage Area. The facilities listed for SWMU #6 encompass SWMU #7. < 10

f. SWMU #9 is the Closed Landfill. The facilities within the stated boundaries are bldg 903 (new corral), Fleet Training Unit bldgs 672 and 673, bldgs 1838, 246, 674, 641, Butler bldg (across from bldg 246), McDonalds, bldg 671 (K-9 kennel), bldg 801 (Naval Station Storage), Naval Station Brigade, bldg 661 (Fleet Ballistic Missile Training Facility). 115

Marvin Sturdivant

#25

RECORD OF ☐ VISIT ☑ CONFERENCE OR ☐ TELEPHONE CALL

TIME: 1:00pm

DATE: 6/3/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION

John Sneed, Bill Book, Glen Lawhon,
Todd Daniels, Robert Hipscomb, Chuck Mason

COPIES TO:

SUBJECT: Information on the Charleston Naval Base

FILE:

DIGEST

mr. John Sneed stated that Hurricane Hugo did not cause any particular problems in regards to environmental damages. I was given copies of inspection logs from DHEC and the EPA which both stated that no problems were noted.

CONCLUSION, ACTION TAKEN, OR REQUIRED

DATE: 6/4/92

ORIGINATOR: P. Al Mason

460 JK 10/
462 EG

REPORT FORM
FOR
AUDITS, INSPECTIONS, AND REVIEWS

Organization Represented: SCDHEC + EPA

Name of Team: Emergency Response Team

Number of People on Team: 4

Purpose: To survey Charleston area industries for environmental damage as a result of hurricane Hugo. Of particular interest was bulk oil and fuel storage facilities.

Dates in Shipyard: From 9/26/89 To 9/26/89

Lead Code: 461

Shipyard Codes Involved: none

Total Estimated number of Mandays spent by Shipyard preparing for, during, and after the audit (report, etc.): 0.25

FORWARD COMPLETED COPY TO CODE 460 VIA YOUR SUPERVISOR

The team also met with LT Sullivan, NSC Code 700, and toured the NSC Fuel Facilities. The team identified no particular problems with Naval Base Facilities.

Alan Shanty

460
462

REPORT FORM
FOR
AUDITS, INSPECTIONS, AND REVIEWS

Organization Represented: SC DHEC

Name of Team: Water team

Number of People on Team: 2

Purpose: Inspect and Sample potable water System after Hurricane Hugo

Dates in Shipyard: From 9/25/89 To 9/25/89

Lead Code: 460 Code 460 POC: 462.11

Shipyard Codes Involved: N/A

Notes: Water OK to drink per Mike Murphy, SCDHEC on 9/26/89

Total Estimated number of Mandays spent by Shipyard preparing for, during, and after the audit (report, etc.): 0.5

FORWARD COMPLETED COPY TO CODE 460 VIA YOUR SUPERVISOR WITHIN THREE WORKING DAYS OF VISIT/INSPECTION COMPLETION.

Gradient Corporation

Risk Assessment and Development of Health-Based Soil Clean-up Goals for the Charleston Navy Shipyard

November 22, 1991

1728 16th Street, Suite 201, Boulder, CO 80302 • (303)442-4313 • Telefax (303)442-5180

SECTIONS CITED FROM REFERENCE 16

SECTION: 2.0, 7.2

REPORT OF FIELD ACTIVITIES
CLOSURE OF INTERIM STATUS
HW FACILITIES
NAVAL SHIPYARD
CHARLESTON, SC.

Prepared for
Southern Division
Naval Facilities Engineering Command
Charleton, SC

Prepared by
Environmental and Safety Designs, Inc. (EnSafe)
Memphis, TN

March, 1988

RECORD OF ☐ VISIT ☐ CONFERENCE OR ☑ TELEPHONE CALL | TIME 11:15 am | DATE 6/11/92

NAME(S) OF PERSON(S) CONTACTED OR IN CONFERENCE AND LOCATION | COPIES TO:

Mr. Ron Hall 803-743-4961
Disaster Preparedness Coordinator
Charleston Naval Base

SUBJECT Environmental Impact of Hurricane Hugo | FILE:

DIGEST

According to Mr. Hall a one-block area along the Cooper river was inundated with water when Hurricane Hugo struck the area. Water was pushed into this area along the base during the tidal surge that struck. According to Mr. Hall the eye of the hurricane moved up the Cooper River inland.

CONCLUSION, ACTION TAKEN, OR REQUIRED

Based on this it will be assumed that the tidal surge inundated the DRMO staging area and SWMU #2, the lead contamination area.

DATE	ORIGINATOR
6/11/92	P. McPherson

South Carolina
State Water Assessment

Ashley-Cooper River Sub-basin

GENERAL OVERVIEW

The Ashley-Cooper River Sub-basin is located in the Lower Coastal Plain in the southeast portion of South Carolina. The sub-basin extends inland for approximately 45 miles to Lake Moultrie at its widest point and encompasses portions of Berkeley, Charleston, and Dorchester Counties (Fig. 114). The areal extent of the sub-basin is approximately 1,710 square miles, 5.5 percent of the State land area.

Population

The 1980 population of the sub-basin was estimated at 381,400, which was 12.2 percent of South Carolina's total population (Table 102). By the year 2020 the sub-basin population is expected to reach 705,100, an increase of 84.9 percent. Dorchester County is expected to have the most rapid rate of growth (244.9 percent) during this period, primarily along an axis of towns extending northwest from the Charleston urbanized area.

The major centers of 1980 population in the sub-basin were Charleston (69,291), North Charleston, including Charleston Heights (55,284), James Island (21,600), Mt. Pleasant (13,715), Hanahan (13,049), St. Andrews (9,202), and Summerville (6,154).

In general, this is an urban region, with the majority of the population in all three counties classified as urban. The urban focus of the region is the City of Charleston.

Economy

The 1979 per capita income in the sub-basin ranged from $5,439 in Berkeley County, which ranked 38th in the State, to $7,652 in Charleston County, which ranked sixth. The mean per capita income for the region was $6,501, which is below the State's average of $7,056. The 1980 median household income in the sub-basin averaged $16,562, slightly above that for the State as a whole. Charleston County led the sub-basin with a median household income of $17,241.

During 1979, the combined annual average employment of nonagricultural wage and salary workers in the three sub-basin counties totaled 145,300. Dominant employment types were, government, 30.8 percent; wholesale and retail trade, 21.7 percent; services and mining, 16 percent; manufacturing, 13.4 percent; construction 7.6 percent; transportation and public utilities, 6.1 percent; and finance, insurance, and real estate, 4.3 percent. Compared to the State as a whole, the Ashley-Cooper area has less than its share of manufacturing employees and a greater proportion of the remaining categories, particularly government employees because of the large number of military installations.

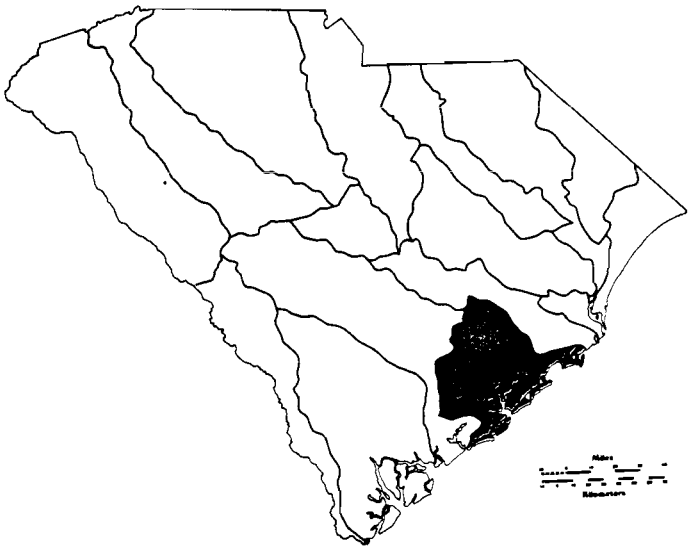


Figure 114.
Location of the Ashley-Cooper River Sub-basin in South Carolina.

Table 102.
Current and projected population for the Ashley-Cooper River Sub-basin, South Carolina, 1980-2020.

County	% Population in Sub-basin[a]	Population (in thousands)					% Change 1980-2020
		1980	1990	2000	2010	2020	
Berkeley	87.1	83.4	120.6	166.0	213.1	243.1	191.5
Charleston	93.8	260.8	294.0	311.9	326.2	333.7	28.0
Dorchester	63.1	37.2	56.5	82.0	109.8	128.3	244.9
Total		381.4	471.1	559.9	649.1	705.1	84.9

[a] Estimated percent of total county population living within the hydrologic boundary of the sub-basin (S.C. Water Resources Commission, 1975)

Sources: S.C. Division of Research and Statistics, 1981.
S.C. Water Resources Commission, 1981

In the sectors of manufacturing, mining, and public utilities, the region had an annual product value of $1,620.3 million during fiscal year 1978-79, which was 7.5 percent of the State total.

Agricultural activity is not very intense in this section of the State, although Charleston County did rank 12th in the State for cash crop receipts from farm marketings in 1979, with a total of $19,615 million.

SURFACE WATER

Hydrology

The two major freshwater rivers draining this sub-basin are the Ashley River and the Cooper River. These tidally influenced rivers along with several saltwater tidal creeks and rivers discharge into Charleston Harbor. Numerous tidal streams draining developed and undeveloped areas along the coast discharge into the Atlantic Ocean. All streams in the sub-basin are entirely within the Lower Coastal Plain. A segment of the Ashley River from S.C. Highway 165 bridge to the Seaboard Coastline Railroad bridge near North Charleston has been determined eligible for inclusion in the State Scenic Rivers Program. The Charleston metropolitan area makes extensive use of these surface-water resources.

Streamflow data in this sub-basin is somewhat limited. Routine streamflow monitoring by the U.S. Geological Survey is not performed. Special studies, however, have provided some hydrologic information. Streamflow in the Cooper River is regulated by releases from the Pinopolis Hydroelectric Plant. Current weekly average discharge at Pinopolis is 15,600 cfs and is highest during the winter months and lowest in the autumn months (S.C. Water Resources Commission, 1979). The majority of the water discharged at Pinopolis has been diverted from the Santee River into Lake Moultrie. Construction is underway to redivert much of this water back into the Santee River. Upon completion of the rediversion project, planned for 1983, weekly average discharge at Pinopolis will be reduced to 3,000 cfs.

Streamflow within this sub-basin provides a limited source of freshwater and after completion of the rediversion project available supplies will decrease even more. Currently, the impoundment of freshwater streams within the sub-basin and the transfer of water from outside the sub-basin provide most available surface-water supplies.

Development

Most surface-water development in this coastal sub-basin includes navigation projects in and around the Port of Charleston and flood control projects in urbanized areas (Fig. 115). In addition, hydroelectric development has resulted in the creation of one of the largest lakes in South Carolina.

Lake Moultrie is the largest reservoir in the sub-basin (Table 103). The completion of the Pinopolis Dam in 1941 created the lake which is located on the Cooper River north of Moncks Corner and is owned and managed by the S.C. Public Service Authority (Santee-Cooper). It is the fourth largest lake in the State with a surface area of 60,400 acres. A volume of approximately 1,200,000 acre-feet ranks it fifth in that category among lakes in the State. Presently, Lake Moultrie's waters flow down the Cooper River and enter Charleston Harbor. In order to help alleviate a severe silting problem in the harbor, a canal is being constructed near St. Stephens to redivert Lake Moultrie's waters into the Santee River, thereby reducing the average flow of the Cooper River from its present 15,600 cfs to 3,000 cfs. Since this diversion of water will greatly reduce the output of electricity from the Jefferies Hydropower facility at Pinopolis Dam, a new hydropower facility is being constructed on the rediversion canal which will compensate for the loss of hydroelectric production. The expected completion date for the project is 1983. In addition to power production, Lake Moultrie is used for recreation and includes a large portion of the Santee National Wildlife Refuge.

The City of Charleston owns two reservoirs, Back River Reservoir and Goose Creek Reservoir, from which it obtains municipal and industrial water supplies. Originally tidally influenced creeks, the two streams were impounded for the storage of freshwater.

Back River Reservoir receives water primarily from the Cooper River and supplies mainly industrial customers, although it is also used as an alternate municipal supply source. Goose Creek Reservoir is used for recreational purposes and as a back-up municipal supply source. Together the two reservoirs have a total surface area of 1,450 acres and an approximate volume of 13,000 acre-feet.

The total surface area of all lakes larger than ten acres is 66,281 acres. The total volume is approximately 1,250,000 acre-feet. Those lakes larger than 200 acres are listed in Table 103.

No potential hydropower sites have been identified within the sub-basin. Existing sites are presented in Table 104 and Figure 115.

The U.S. Army Corps of Engineers has been involved in numerous navigation projects in the sub-basin. The majority of the work is associated with Charleston Harbor (Table 105).

The U.S. Army Corps of Engineers completed a flood control project on Sawmill Branch in 1971 and is currently involved in several other projects. The Soil Conservation Service has only one project within the sub-basin, the Lower Berkeley flood control project, which is still in the planning stages. All projects and studies are presented in Table 106.

Water Quality

Water bodies of several different water use classifications occur in the Ashley-Cooper River Sub-basin (Fig. 116). Lake Moultrie is the only Class A water body in this sub-basin. All other classified freshwaters have Class B water use designations. Classified saltwater bodies include Class SA, Class SB, and Class SC water use designations. Water quality limited segments which require advanced treatment of wastewater effluents include all of Lake Moultrie, Back River, Goose Creek, and several minor tributary streams (Fig. 117). Water quality conditions in this highly developed sub-basin are generally adequate for most current water use needs. Problem conditions in the Ashley River and altered water quality conditions after completion of the Cooper River Rediversion Project may affect some water use activities in portions of the sub-basin.

The Ashley River has historically exhibited degraded water quality conditions which have limited some designated water use activities. Early studies by the U.S. Department of Health, Education, and Welfare (1965) indicate grossly polluted conditions and frequent fish kills, due to municipal and industrial wastewater discharges. However, more recent studies indicate improved conditions due to more advanced and expanded municipal waste treatment (S.C. Department of Health and Environmental Control, 1975a; CH2M Hill and Betz Environmental Engineers, Inc., 1978). Contraventions of State standards for dissolved oxygen and fecal coliform bacteria in addition to high phosphorus (nutrients) concentrations still occur and are attributed to municipal and industrial point source discharges and non-point source runoff from the highly developed watershed. The taking of shellfish is prohibited from portions of this river due to fecal coliform bacteria contamination (Fig. 117).

Water quality in Lake Moultrie has been good with no observed violations of State standards (S.C. Department of Health and Environmental Control, 1975a; CH2M Hill and Betz Environmental Engineers, Inc., 1978). The U.S. Environmental Protection Agency (1976e) classified this lake as eutrophic and ranked it fifth in trophic quality out of 13 South Carolina lakes surveyed. Trophic quality of this lake was higher than that of upstream Lake Marion. Except for temporary localized turbidity problems during construction, the U.S. Army Corps of Engineers (1975) does not anticipate the Cooper River Rediversion Project to affect water quality conditions in Lake Moultrie. However, concern exists that alteration of flow patterns in the lake after rediversion may aggravate existing nuisance aquatic plant problems and adversely affect drainage of low lying areas around the lake (Howard Roach, S.C. Public Service Authority, personal communication, March 1982).

While the Cooper River exhibits generally good water quality, conditions in the upper portion of the river are better than in the stretch below Back River Reservoir (S.C. Water Resources Commission, 1974; S.C. Department of Health and Environmental Control, 1980b). Water quality conditions in this lower portion of the river are not suitable to allow the harvesting of shellfish (Fig. 117). Abundant nuisance aquatic plant populations along this river, estimated at 4,600 acres, occasionally impact some recreational activities (S.C. Aquatic Plant Management Council, 1981). Water quantity and quality in the Cooper River should be greatly affected by the Cooper River Rediversion Project. This project, expected to be completed in late 1983, will reduce the average streamflow in the Cooper River from the current 15,600 cfs to 3,000 cfs after rediversion. The U.S. Army Corps of Engineers (1975) anticipates that reduced streamflow will decrease waste assimilative capacity of the river, increase saltwater intrusion and salinity levels, decrease biological productivity, increase aquatic plant growth in adjacent rice fields, and reduce anadromous fish migration and resident fish populations in this river. Some questions still exist over the magnitude and extent of saltwater intrusion in the Cooper River and resultant water use impacts after rediversion. Early studies indicate that oceanic saltwater intrusion would not sufficiently penetrate up the river to adversely impact Back River Reservoir, a major freshwater resource for local municipalities and industry (S.C. Water Resources Commission, 1974; Benson and Boland, 1977). However, more recent studies indicate that saltwater may intrude a sufficient distance to occasionally impact water quality and water use in Back River Reservoir (S.C. Water Resources Commission, 1979; Chigges and Taylor, 1981).

Currently, water quality in the main body of Back River Reservoir meets State standards and criteria. Foster Creek,

Table 103.

Existing lakes larger than 200 acres in the Ashely-Cooper River Sub-basin, South Carolina.

Map No	Name	Stream	Surface Area (acres)	Storage Capacity (acre-feet)	Purpose
1	Lake Moultrie	West Branch Cooper River	60,400	1,211,000	Power Recreation Water supply
2	Back River Reservoir	Back River	850	8,500	Industry Recreation Water supply
3	Goose Creek Reservoir	Goose Creek	600	4,800	Recreation Water supply
4	Unnamed	Jack Creek	500	2,500	Recreation

Source S.C Water Resources Commission, 1974

Table 104.

Existing and potential hydroelectric power development in the Ashley-Cooper River Sub-basin, South Carolina.

Map No.	Facility/Site Name	Facility/Site Location		Owner	No. of Units	Total Capacity (MW)	Surface Area (acres)	Status
		County	River					
5	Jefferies (Pinopolis)	Berkeley	Cooper	SCPSA[a]	5	132.6	60,400	Const. 1942
6	St. Stephens	Berkeley	Rediversion Canal	SCPSA	--[b]	84.0	60,400	Under const.

[a] SCPSA indicates S C Public Service Authority
[b] -- indicates information not available

Sources Federal Power Commission, 1970
U S Army Corps of Engineers, 1982a

Table 105.

U.S. Army Corps of Engineers navigation projects in the Ashley-Cooper River Sub-basin, South Carolina.

Map No.	Project Name	County	Responsible District	Length (miles)	Width (feet)	Status/Remarks
7	Town Creek	Charleston	Charleston	1.0	80	Project provides for a 12 foot entrance channel across the ocean bar; and then a 10 foot channel up Five Fathom Creek to the Intracoastal Waterway. Completed 1974.
8	Beresford Creek	Charleston	Charleston	1.8	60	Project provides for a 6 foot deep Creek channel from deep water in Cooper River via Clouter Creek up Beresford Creek, a distance of 1.8 miles. Project deauthorized in 1977.
9	Charleston Harbor	Charleston	Charleston	25.3	400-1000	Project provides for: 35 foot deep channel from the Atlantic Ocean to mouth of Goose Creek; a 35 foot deep channel through Town Creek; a 10 foot deep channel in Shem Creek to Hwy. 17; two stone entrance jetties. A 40 foot deep channel for defense purposes is proposed. The project is continuing.
10	Shipyard River	Charleston	Charleston	1.2	200-600	Project provides for 30 foot deep channel from deep water in the Cooper River to the Carbide Inc. plant on Shipyard River. The project is complete.
11	Ashley River	Charleston	Charleston	7.4	300	Project provides for a 30 foot deep channel from the mouth to Stowchard Wharf. Project completed in 1940.
12	Folly River	Charleston	Charleston	8.8	80-100	Project provides for: 11 foot deep channel from the ocean to the mouth of Folly River; a 9 foot deep channel from the mouth to Hwy. 171. A 9 foot deep channel within Folly Creek from Hwy. 171 to Folly River. Project completed in 1979.
13	Abbapools Creek	Charleston	Charleston	5.0	60	Project provides a 4 foot deep channel from the mouth on the Stono River to a point 5 miles upstream. Project deauthorized 1975.

Source U.S Army Corps of Engineers, 1982b

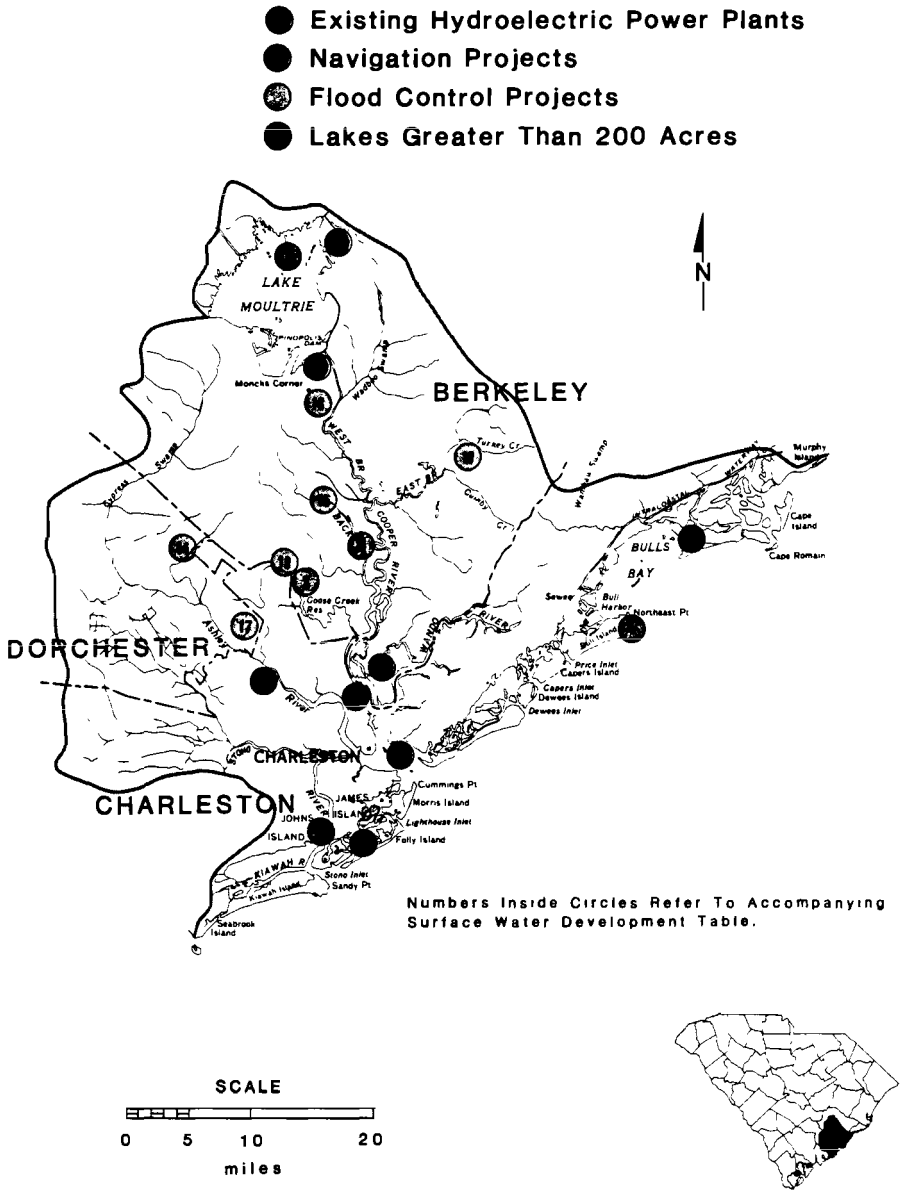


Figure 115.
Surface-water development in the Ashley-Cooper River Sub-basin, South Carolina.

Table 106.
Flood control projects in the Ashley-Cooper River Sub-basin, South Carolina.

Map No.	*Project/Watershed Name*	*County*	*Responsible Agency*[a]	*Status*
14	Sawmill Branch	Dorchester Berkeley Charleston	COE	Completed 1971
15	Lower Berkeley	Dorchester	SCS	Terminated
16	California Branch	Berkeley	COE	Deauthorized 1979
17	Eagle Creek	Dorchester	COE	Project authorized
18	Goose Creek	Charleston/ Berkeley	COE	Study in progress
19	Turkey Creek	Charleston/ Berkeley	COE	Inactive

[a] COE indicates U.S. Army Corps of Engineers
SCS indicates Soil Conservation Service

Sources U.S Department of Agriculture, 1980, 1983
U.S Army Corps of Engineers, 1982c

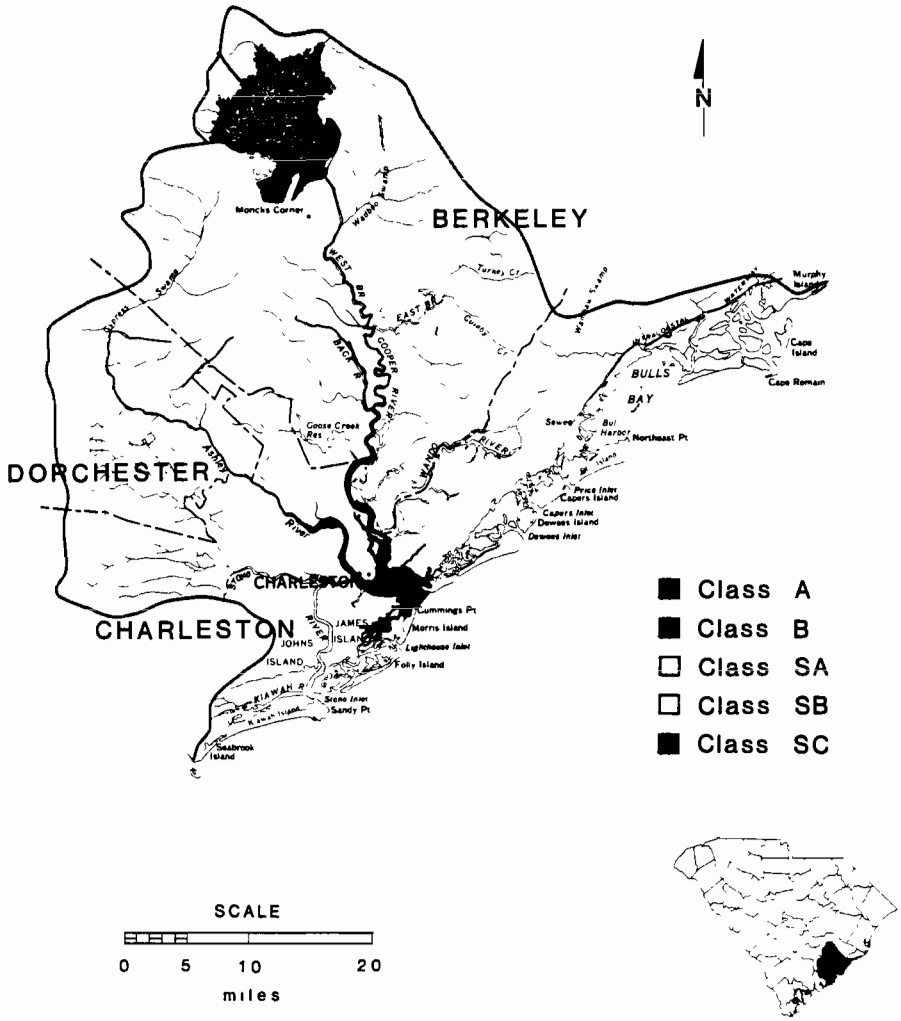


Figure 116.
Surface-water quality classifications in the Ashley- Cooper River Sub-basin, South Carolina (S.C. Department of of Health and Environmental Control, 1980a).

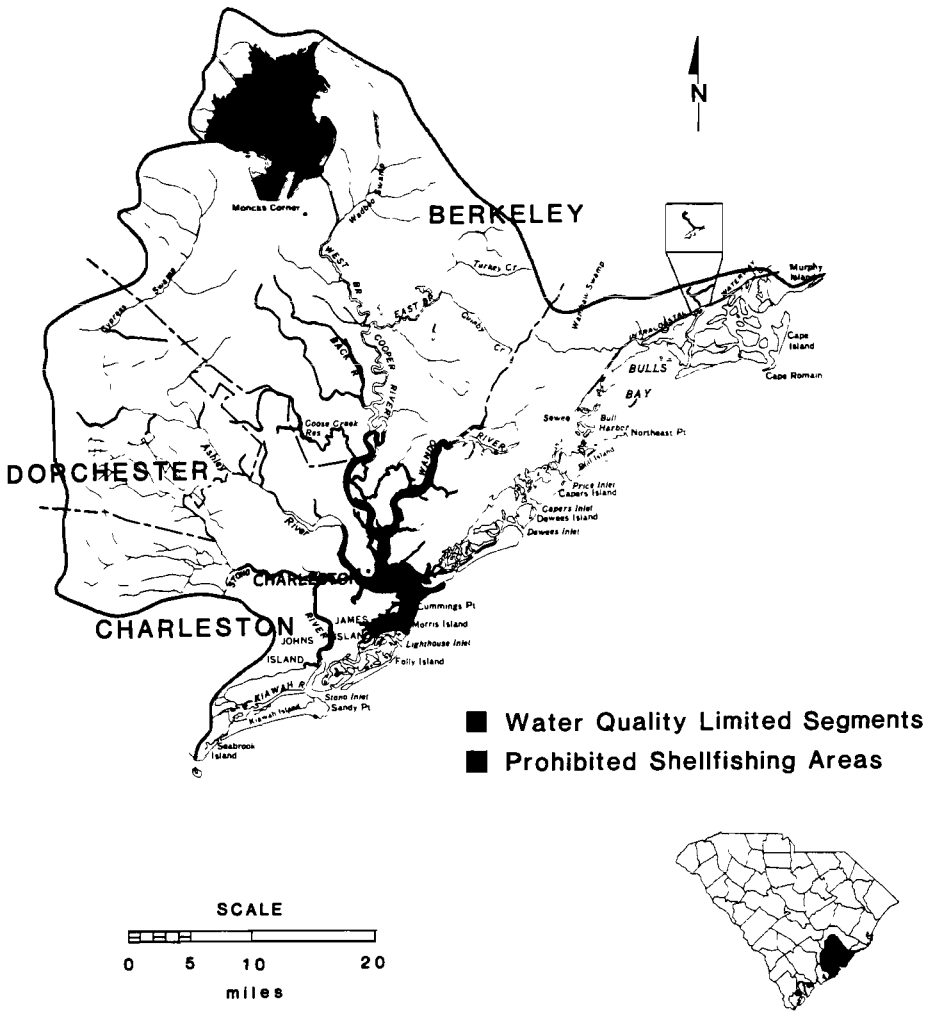


Figure 117.
Water quality limited segments and prohibited shellfishing areas in the Ashley-Cooper River Sub-basin, South Carolina (S. C. Department of Health and Environmental Control, 1979).

a major tributary to the reservoir, exhibits degraded conditions evidenced by contraventions of State dissolved oxygen standards and elevated levels of biochemical oxygen demand, specific conductance, hardness, alkalinity, chlorides, nutrients, and some metals (Lagman and others, 1980). These poor water quality conditions have been attributed to point and non-point sources. Abundant nuisance aquatic plant populations dominated by Brazilian elodea, alligatorweed, and water primrose severely impact numerous water uses in this reservoir. The S.C. Aquatic Plant Management Council (1981, 1982) has identified Back River Reservoir as one of the major aquatic plant problem areas in the State. Although current water quality is generally adequate for most water use needs, possible increases in chloride concentrations in the reservoir after rediversion may disrupt some municipal and industrial water use activities (S.C. Water Resources Commission, 1979; Chigges and Taylor, 1981).

Goose Creek Reservoir, which is used for recreation and serves as a municipal water supply for the City of Charleston, is severely impacted by approximately 300 acres of nuisance aquatic vegetation. This water body has been identified as one of the major aquatic plant problem areas in the State and was provided control funds in 1982 (S.C. Aquatic Plant Management Council, 1981, 1982).

The Wando River exhibits the best water quality of all the major rivers entering Charleston Harbor. Due to impacts from the Cooper River and Charleston Harbor, water quality at the mouth of the Wando River is not as good as farther upstream (S.C. Water Resources Commission, 1973). This lower portion is closed to shellfish harvesting due to unsuitable water quality conditions (Fig. 117). Recent port development on this river is not expected to cause long-term water quality problems (S.C. Water Resources Commission, 1974). Reduced flows in the Cooper River due to rediversion are expected to increase salinity and destroy

existing sub-tidal oyster beds in the lower portion of the Wando River (U.S. Army Corps of Engineers, 1975; S.C. Water Resources Commission, 1979).

Water quality conditions in Charleston Harbor are affected by the Ashley, Cooper, and Wando Rivers and the Atlantic Ocean. The harbor has experienced water quality problems in the past. However, while occasional depressed dissolved oxygen levels still occur and shellfish harvesting is still prohibited, water quality conditions have recently improved (CH2M Hill and Betz Environmental Engineers, Inc., 1978). Reduced flow in the Cooper River after completion of the rediversion project is expected to decrease the sediment load entering Charleston Harbor and therefore reduce shoaling. Current stratified conditions due to salinity differences should also change, creating a well mixed estuary. Water quality conditions in the harbor may improve further due to accelerated tidal flushing of wastes (Federal Water Pollution Control Administration, 1966).

GROUND WATER

Hydrogeology

The level of hydrogeologic knowledge throughout the sub-basin is at the evaluation level (Fig. 18). A cooperative ground-water study is presently being conducted by the S.C. Water Resources Commission and the U.S. Geological Survey. This study is identified as the Trident Ground-Water Study and encompasses the counties of Charleston, Berkeley, and Dorchester. The study will provide an intensive appraisal of ground-water quality and quantity in the Charleston area. A final report on this investigation is anticipated in 1983.

The Ashley-Cooper River Sub-basin lies wholly within the Lower Coastal Plain Province. Six major aquifer systems underlie the sub-basin and include the Middendorf, Black Creek, Peedee, Black Mingo, Tertiary Limestone, and Shallow Aquifer Systems. The thickness of the sediments ranges from about 1,700 to 3,200 feet. The principal sources of public supply water are the Black Creek Aquifer System, the Black Mingo and Tertiary Limestone Aquifer Systems, and the Shallow Aquifer System. Selected ground-water data for the sub-basin are presented in Table 107.

Although the Middendorf Aquifer System underlies the entire sub-basin, it is not generally used as a ground-water source because of its great depth and brackish water.

The Black Creek Aquifer System underlies all of the Ashley-Cooper River Sub-basin. The top of this aquifer system occurs at 430 feet below mean sea level at St. Stephens near the northern extreme of the sub-basin and dips to approximately 1,000 feet below mean sea level at Mt. Pleasant on the coast. Its thickness ranges from 600 feet in the northern part of the sub-basin to 750 feet at the southern part. This aquifer system is potentially the most productive water bearing unit in the sub-basin, but because of its depth only large municipalities and industries have the financial resources to develop it. For example, 14 major industrial and municipal wells which are screened in the Black Creek Aquifer System have yields ranging from 200 to 500 gpm with specific capacities of less than 10 gpm/ft. The development of well yields of up to 1,000 gpm are thought to be possible in most of the sub-basin.

The Peedee Aquifer System overlies the Black Creek Aquifer System and is about 250 feet thick. Because of its low permeability there are no wells known to be screened in this aquifer within the sub-basin.

Sand, clay, and limestone beds within the Black Mingo Aquifer System lie close to land surface north of Bonneau and thicken from about 200 feet at St. Stephens to 350 feet near Sullivan's Island. Sediments of the Black Mingo Aquifer System dip to the south-southeast at 8 to 12 feet per mile. The Black Mingo Aquifer System underlies the entire Ashley-Cooper River Sub-basin.

The Tertiary Limestone Aquifer System also underlies the entire sub-basin. Its thickness ranges from a few feet at Bonneau to approximately 200 feet at Sullivan's Island. North of Huger and McClellanville, the Tertiary Limestone Aquifer System is highly permeable and adequate water supplies are obtained without drilling into deeper lying

Table 107.
Selected ground-water data for the Ashley-Cooper River Sub-basin, South Carolina

Vicinity	*Aquifer System*	*Screened Depths (feet)*	*Yield (gpm)*	*Specific Capacity (gpm/ft)*
Moncks Corner	Tertiary Limestone /Black Mingo	200	250	Less than 4
Goose Creek-Summerville	Tertiary Limestone /Black Mingo	300-500	250	--[a]
Cypress Gardens	Tertiary Limestone /Black Mingo	--	500-1000	15
Mt. Pleasant	Shallow	40-60	40-175	--

[a]-- indicates data not readily available

Black Mingo sands. However, most wells penetrate and are open to both aquifer systems.

The Tertiary Limestone and the Black Mingo Aquifer Systems are the most extensively developed ground-water sources south of Moncks Corner, Huger, and McClellanville. Well yields in this area vary with location and depth (Table 107). Water levels in the Tertiary Limestone-Black Mingo Aquifer Systems vary from approximately 80 feet above sea level at Cross, to about 10 feet below sea level at Charleston. Water levels in the Tertiary Limestone and Black Mingo Aquifer Systems have decreased significantly in some parts of the sub-basin. The most notable declines have occurred between Goose Creek and Moncks Corner, where water levels are 5 to 15 feet below those in wells of the surrounding areas and on the Charleston neck, where water levels have been depressed as much as 70 feet below original levels. In the northern section of the sub-basin, ground-water movement in the Tertiary Limestone-Black Mingo Aquifer Systems is controlled by the topography of the Santee River Valley and Lake Moultrie. Ground water within the confines of the Santee River Valley discharges towards the river and fluctuations in river stage affect both water levels and the rate of ground-water discharge. The fluctuations in lake surface elevations of Lake Moultrie cause corresponding changes in ground-water levels of the Tertiary Limestone-Black Mingo Aquifer Systems in the vicinity of the lake. South of Lake Moultrie and the Santee River, ground-water flows to the south-southeast.

The Shallow Aquifer System underlies the entire sub-basin. It is generally composed of interbedded marine sands and clays, and locally contains shell and limestone beds. The thickness of the aquifer system ranges from about 10 feet in northern Berkeley County to more than 50 feet in coastal Charleston County. The Shallow Aquifer System is relatively thin in most of Berkeley County and, therefore, is not extensively used. However, in coastal Charleston County, the system is thicker and is a preferred source of ground-water supply. The greatest number of shallow wells exist in the area south of McClellanville and east of U.S. Highway 17, where the population density is highest and where most underlying aquifers contain brackish water. Within that area, the municipalities of McClellanville, Mt. Pleasant, Isle of Palms, and Sullivan's Island rely heavily on the Shallow Aquifer System as a sole or supplementary source of water, as do numerous domestic users. Yields from shallow wells may be highly variable depending on intended use, thickness of the aquifer, and local lithology. Domestic wells are usually less than 40 feet deep and pump between 8 and 15 gpm. Municipal wells are generally more productive. Groups of wells on Sullivan's Island, ranging from 20 to 30 feet deep, collectively yield about 100 gpm.

Water Quality

Ground water in all major aquifers exhibit progressively increasing chloride and fluoride concentrations nearer the coast. Concentrations of most constituents also increase with increasing depth. In the Charleston vicinity, concentrations of chlorides range from less than 250 mg/L to more than 1,000 mg/L in ground water from the Tertiary Limestone Aquifer System. During the last twenty years, chlorides in the Tertiary Limestone and Black Mingo have increased as a result of large ground-water withdrawals. The fluoride content increases from less than 1 mg/L in Summerville to more than 5 mg/L along the coast.

Water quality of the Black Creek Aquifer System is representative of a sodium bicarbonate type and is generally soft, with a pH ranging from 8.4 to 8.6 and low iron concentrations (Fig. 118). The Black Mingo Aquifer System contains water of the sodium and calcium bicarbonate type and has high concentrations of dissolved silica. The Tertiary Limestone Aquifer System contains water classified as a calcium bicarbonate type which is moderately hard to hard with iron concentrations often exceeding acceptable drinking water limits.

WATER USE

Gross water use is 399 mgd of which 14.2 mgd is consumed (Table 108). This sub-basin's gross usage is sixth in the State. Thermoelectric power generation is the leading gross water user in the sub-basin withdrawing 372 mgd, self supplied industry is second withdrawing 10.3 mgd, and self-supplied domestic is the third withdrawing 8.8 mgd. The major water users by type and supply source are shown in Figure 119.

Surface water supplies 96 percent of the gross water use demand. Excluding the thermoelectric power water use, ground water supplies 60 percent of gross demand. Approximately 65 mgd of Edisto River water is transported into this sub-basin for public supply and industrial use. This use is accounted for in the Edisto River Sub-basin.

Public supply use represents one percent of the total gross use and almost three percent of consumptive use. Most of the public supply needs are met by surface water transported into the sub-basin. Of the approximately 65 mgd transferred into the sub-basin, 44 mgd are for public supply. Currently, 4 mgd of ground water is used for public supply.

Self-supplied domestic water use, which depends solely on ground-water sources, accounts for two percent of the gross water use. However, this use accounts for 53 percent of the consumed water use. This use is the leading ground-water withdrawal in the sub-basin, and the largest rural domestic ground-water withdrawal in the State.

Agricultural water use represents less than one percent of the sub-basin gross water withdrawal, with 0.53 mgd use, and four percent of the consumptive use. Irrigation demand accounts for 62 percent of agricultural gross usage with ground water supplying 58 percent of this demand. When

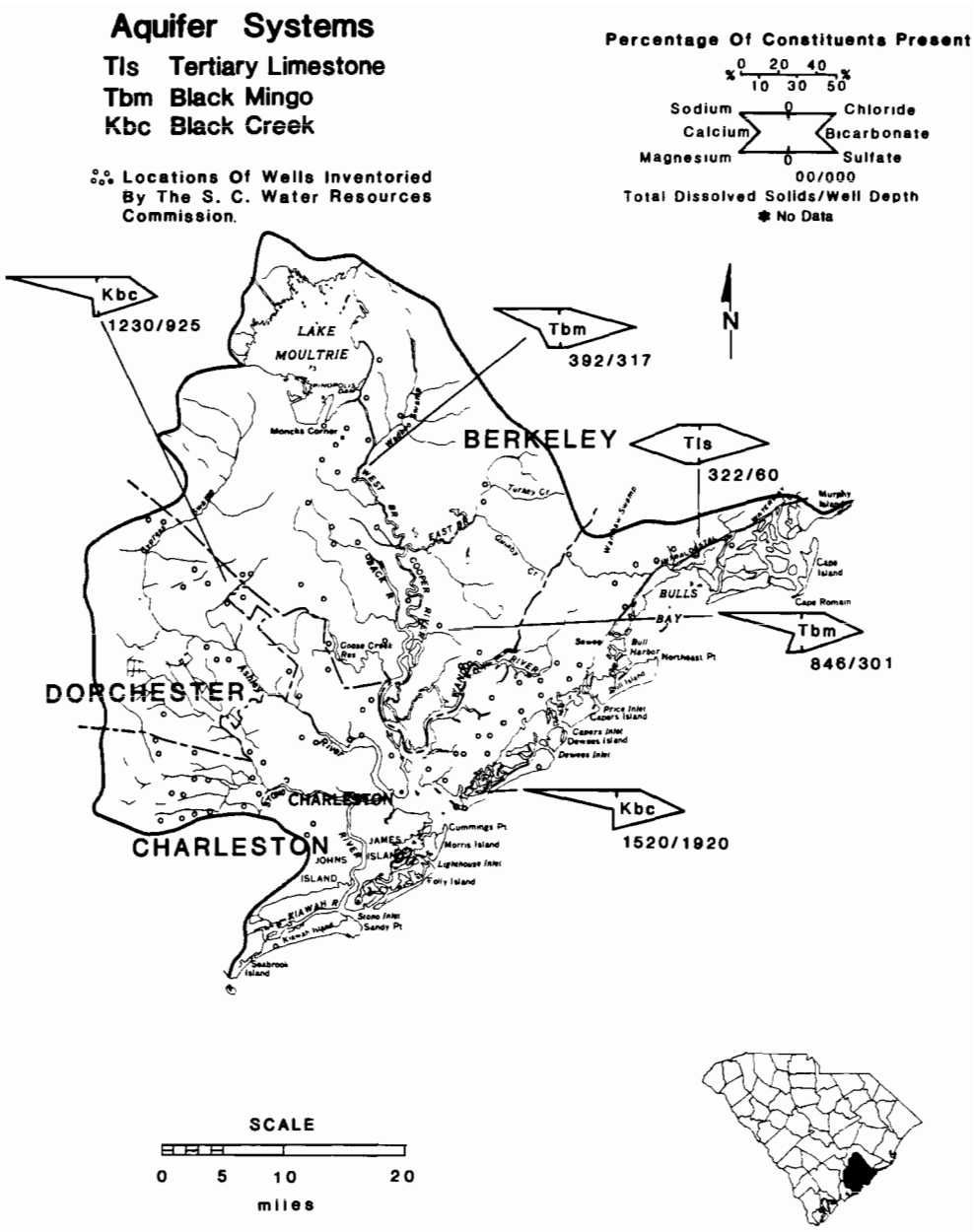


Figure 118.
Ground-water quality of selected aquifer systems and major inventoried wells in the Ashley-Cooper River Sub-basin, South Carolina.

Table 108.

Current and projected water use in the Ashley-Cooper River Sub-basin, South Carolina, 1980 - 2020.

		Water Use (mgd)														
		1980			1990			2000			2010			2020		
Type Use		Ground Water	Surface Water	Total Water	Ground Water	Surface Water	Total Water	Ground Water	Surface Water	Total Water	Ground Water	Surface Water	Total Water	Ground Water	Surface Water	Total Water
Public Supply	Gross	4.1	0.0	4 16	5.20	16 4	21 6	6.24	32 9	39.1	7.18	47 3	54.5	7 89	59 3	67.2
	Consumed	0 42	0 0	0 42	0.52	1 64	2.2	0 62	3.29	3.91	0 72	4 73	5 45	0 79	5 93	6.72
Self-supplied Domestic	Gross	8.8	---	8.8	11	---	11	13	---	13	15	---	15	17	---	17
	Consumed	7.5	---	7.5	9 4	---	9 4	11	---	11	13	---	13	14	---	14
Agriculture Irrigation	Gross	0 19	0 14	0.33	0 67	0.39	1 1	1.2	0.58	1 8	1.6	0 75	2 4	2.1	0 90	3.0
	Consumed	0.19	0.14	0 33	0.67	0 39	1 1	1.2	0.58	1 8	1 6	0.75	2 4	2 1	0 98	3 0
Agriculture Livestock	Gross	0.10	0 10	0.20	0.11	0 11	0 22	0.13	0 13	0.26	0 15	0 15	0 30	0 17	0 17	0 34
	Consumed	0.10	0 10	0.20	0 11	0 11	0 22	0 13	0.13	0.26	0.15	0.15	0 30	0 17	0 17	0 34
Self-supplied Industry	Gross	2 87	10.3	13 17	3 16	11 9	15 1	3.47	13 0	16 5	3 82	14 3	18 1	4 39	15 8	20.2
	Consumed	0 53	1 91	2 44	0 58	2 20	2 78	0 64	2 41	3 05	0.71	2 65	3.36	0 81	2 92	3 73
Thermoelectric Power	Gross	---	372	372	---	420	420	---	433	433	---	446	446	---	459	459
	Consumed	---	3.36	3.36	---	37 5	37 5	---	61 9	61 9	---	102	102	---	168	168
Total	Gross	16 1	383	399	20.1	449	469	24.0	480	504	27.8	509	536	31 6	535	567
	Consumed	8 74	5.51	14 3	11 3	41.8	53.1	13 6	68 3	81.9	16 2	110	126	17 9	178	196

averaged over the five-month growing season, irrigation use equals 0.80 mgd, comprising 0.2 percent of total sub-basin use. Livestock demand is met equally by ground and surface water.

Self-supplied industry accounts for three percent of the gross water use and 17 percent of the consumptive use. Surface water is used to meet 78 percent of this demand.

Thermoelectric power production is the leading water user, accounting for over 93 percent of the gross water use. This use accounts for 24 percent of consumptive use. Fresh surface water supplies nearly all the demand, however, 16 mgd of saline water use was reported. All three steam power plants were constructed near plentiful water sources.

Total gross water use is projected to grow 42 percent to 567 mgd by the year 2020. Thermoelectric power water use will remain the leading user and surface water the most heavily used source of supply. Public supply water use is projected to increase more than any use type in the sub-basin. This growth will be partially attributed to the increased demand on Back River Reservoir as a public supply source by the City of Charleston.

WATER USE VERSUS AVAILABILITY

Current surface-water withdrawals are made primarily from man-made impoundments and ungaged tributary streams. The largest surface-water use (372 mgd) is by three thermoelectric power plants, one on the Ashley River, one on the Pinopolis tail race canal, and one on Back River Reservoir (Fig. 119). These water bodies provide sufficient supplies to meet current demand. Most remaining surface-water withdrawals occur from Back River Reservoir. This reservoir is well supplied from the Cooper River and tributary streams and provides a reliable supply source.

Adequate water availability for projected 2020 demand is dependent on the type and location of the supply source. Thermoelectric power facilities will continue to be the largest surface-water users (459 mgd) and their current location on well supplied sources assures a reliable surface-water supply. Current impounded freshwaters could provide ample water for the remaining projected demand (76.2 mgd). However, withdrawals from tributary streams may experience periodic interruptions due to low-flow conditions.

Possible saltwater contamination of Back River Reservoir, following rediversion, would greatly impair current and projected use of this important source of fresh surface water and limit further surface-water dependent development in this sub-basin.

Current and projected ground-water demands within the Ashley-Cooper River Sub-basin can be met when certain regulatory measures, such as well construction standards, well spacing, and depth requirements, are maintained. In general, ground-water pumpage from the two principal aquifer systems, the Tertiary Limestone and the Black Mingo, has significantly decreased in the Charleston area. The most potentially productive water bearing aquifer system, that of the Black Creek, is not presently developed because of the greater depth (and the greater cost) required for its development.

Table 108 shows the 1980 recorded ground-water use (16.1 mgd) along with the projected use for the year 2020 (31.6 mgd). The quantity required for present ground-water use could be supplied by one well pumped at a rate of 600 gpm for six hours each day for each 23 square mile area of the sub-basin, or a total of about 75 such wells. The projected requirements for 2020 could be obtained by pumping a similar well in each 12 square mile area which would require about 146 wells pumped at the same time and rate.

Ground-water availability may be limited in certain areas of the sub-basin due to water quality. High chloride concentrations are already present in the Tertiary Limstone Aquifer in the Charleston vicinity and a potential danger of saltwater contamination of the Black Creek Aquifer System in the coastal area may limit its future development. Excessive

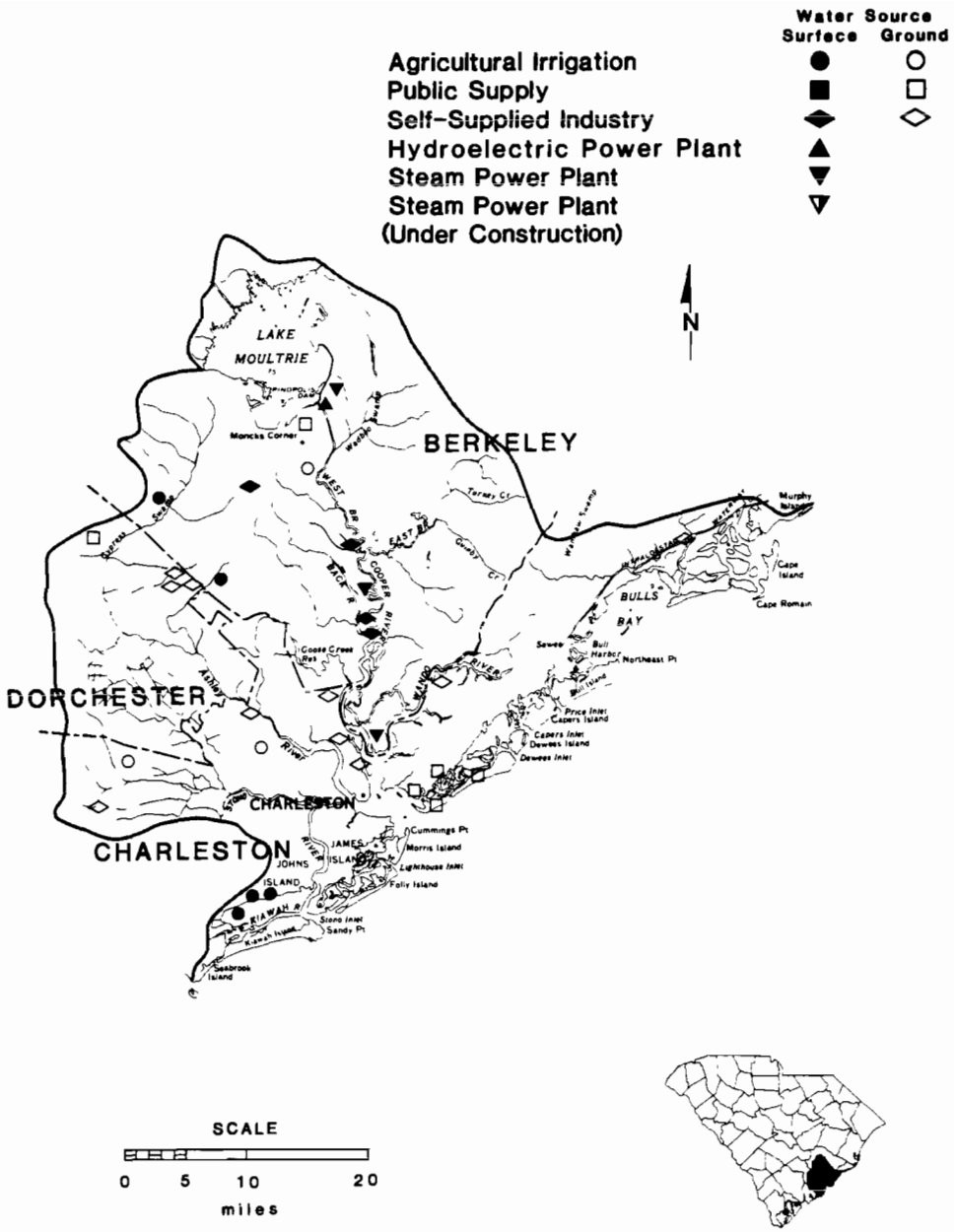


Figure 119.
Location, type, and supply source of water users in the Ashley-Cooper River Sub-basin, South Carolina.

fluoride, chloride, and total dissolved solids within the Black Creek Aquifer System in coastal areas might constitute treatment problems in the future utilization of this resource.

Major water resource problems and opportunities in the sub-basin are summarized in Table 109.

Table 109.

Major water resource findings in the Ashley-Cooper River Sub-basin, South Carolina.

Opportunities

1. Lake Moultrie is a source of large quantities of good quality water.
2. Decreased Cooper River streamflows after completion of the Cooper River Rediversion Project should reduce shoaling in Charleston Harbor, create a well mixed estuary, and possibly accelerate tidal flushing of wastes.
3. Potential deep-draft navigation exists for Charleston Harbor, Cooper River, Wando River, Shipyard River, and the Ashley River.
4. Six major aquifer systems underlie the sub-basin and provide large supplies of ground water able to meet projected (2020) ground water demand.
5. A segment of the Ashley River has been determined eligible for the State Scenic Rivers Program.

Problem

1. Unregulated streams in this Lower Coastal Plain sub-basin have variable, and unreliable flows of low volume.
2. A large portion of the current Cooper River streamflow will be lost after completion of the Cooper River Rediversion Project.
3. Water supply development should include surface-water storage capabilities.
4. Decreased streamflow in the Cooper River following its rediversion will reduce waste assimulative capacity of the river and may allow occasional saltwater intrusion into Back River Reservoir.
5. The Ashley River exhibits marginally degraded water quality conditions with high nutrient levels and occasional contraventions of State standards for dissolved oxygen and fecal coliform bacteria.
6. Abundant noxious aquatic plant populations restrict water use activities on portions of Goose Creek Reservoir, Back River Reservoir, and the Cooper River.
7. Current heavy sediment loading in Charleston Harbor causes dredge and dredge spoil disposal problems.
8. Suitable dredge material disposal sites are difficult to locate and maintain.
9. High flows in Goose Creek, Turkey Creek, and Eagle Creek occasionally cause flood damage to development on adjacent watershed lands.
10. Beach erosion adversely impacts Folly Island and other barrier islands.
11. The Tertiary Limestone Aquifer System in the Charleston area is experiencing saltwater contamination.
12. The potential exists for saltwater contamination of the Black Creek Aquifer System in the coastal areas.
13. Excessive fluoride, chloride, and total dissolved solids concentrations occur in the Black Creek Aquifer System along the coast.
14. Heavy pumpage by closely associated wells causes localized water level declines in the Tertiary Limestone and Black Mingo Aquifer Systems.
15. Heavy pumpage near outcrop areas has caused land surface collapse.

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

CHARLESTON, S.C.

SCALE 1:24000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

1 acre — 10 acres — 20 acres

ACREAGE GUIDE

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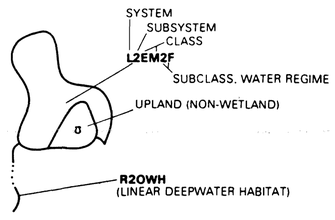

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DATE: 3/ /83	DATE: / /
SCALE: 1:58 000	SCALE:
TYPE: CIR	TYPE:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

1988

M — MARINE

SUBSYSTEM	CLASS	Subclass
1 — SUBTIDAL	RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
	UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
	AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
	RF — REEF	1 Coral, 3 Worm
	OW — *OPEN WATER/ Unknown Bottom*	
2 — INTERTIDAL	AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
	RF — REEF	1 Coral, 3 Worm
	RS — ROCKY SHORE	1 Bedrock, 2 Rubble
	US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

E — ESTUARINE

SUBSYSTEM	CLASS	Subclass
1 — SUBTIDAL	RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
	UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
	AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
	RF — REEF	2 Mollusc, 3 Worm
	OW — *OPEN WATER/ Unknown Bottom*	
2 — INTERTIDAL	AB — AQUATIC BED	1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
	RF — REEF	2 Mollusc, 3 Worm
	SB — STREAMBED	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
	RS — ROCKY SHORE	1 Bedrock, 2 Rubble
	US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
	EM — EMERGENT	1 Persistent, 2 Nonpersistent
	SS — SCRUB-SHRUB	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
	FO — FORESTED	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

R — RIVERINE

SUBSYSTEM	CLASS	Subclass
1 — TIDAL	RB — ROCK	1 Bedrock, 2 Rubble
	UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
2 — LOWER PERENNIAL	*SB — STREAMBED	1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated
	AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
	RS — ROCKY SHORE	1 Bedrock, 2 Rubble
	US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
3 — UPPER PERENNIAL	**EM — EMERGENT	2 Nonpersistent
4 — INTERMITTENT	OW — *OPEN WATER/ Unknown Bottom*	
5 — UNKNOWN PERENNIAL		

L — LACUSTRINE

SUBSYSTEM	CLASS	Subclass
1 — LIMNETIC	RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
	UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
	AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
	OW — *OPEN WATER/ Unknown Bottom*	
2 — LITTORAL	RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
	UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
	AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
	RS — ROCKY SHORE	1 Bedrock, 2 Rubble
	US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
	EM — EMERGENT	2 Nonpersistent
	OW — *OPEN WATER/ Unknown Bottom*	

P — PALUSTRINE

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock, 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
AB — AQUATIC BED	1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
ML — MOSS-LICHEN	1 Moss, 2 Lichen
EM — EMERGENT	1 Persistent, 2 Nonpersistent
SS — SCRUB-SHRUB	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
FO — FORESTED	1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
OW — *OPEN WATER/ Unknown Bottom*	

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MODIFIERS

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WATER REGIME

Non-Tidal:
- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K *Artificially Flooded*
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal:
- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity:
- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity:
- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water:
- a Acid
- t Circumneutral
- i Alkaline

SOIL
- g Organic
- n Mineral

SPECIAL MODIFIERS
- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

CHARLESTON, S.C.

NORTH CHARLESTON, S.C.

JOHNS ISLAND, S.C.

FORT MOULTRIE, S.C.

JAMES ISLAND NW
JAMES ISLAND

JAMES ISLAND, S.C.

CHARLESTON, S.C.

SCALE 1:24000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

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AERIAL PHOTOGRAPHY

DATE:	3 / / 83	DATE: / /
SCALE:	1:58 000	SCALE:
TYPE:	CIR	TYPE:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory
1988

SYSTEM: M — MARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL			
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM: E — ESTUARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL								
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	SB — STREAMBED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm		1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

SYSTEM: R — RIVERINE

SUBSYSTEM	1 — TIDAL		2 — LOWER PERENNIAL		3 — UPPER PERENNIAL		4 — INTERMITTENT		5 — UNKNOWN PERENNIAL	
CLASS	RB — ROCK	UB — UNCONSOLIDATED BOTTOM	*SB — STREAMBED	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	**EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*		
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent			

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SYSTEM: L — LACUSTRINE

SUBSYSTEM	1 — LIMNETIC				2 — LITTORAL						
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	OW — *OPEN WATER/ Unknown Bottom*	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SYSTEM: P — PALUSTRINE

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS-LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

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- n Mineral

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- h *Diked/Impounded*
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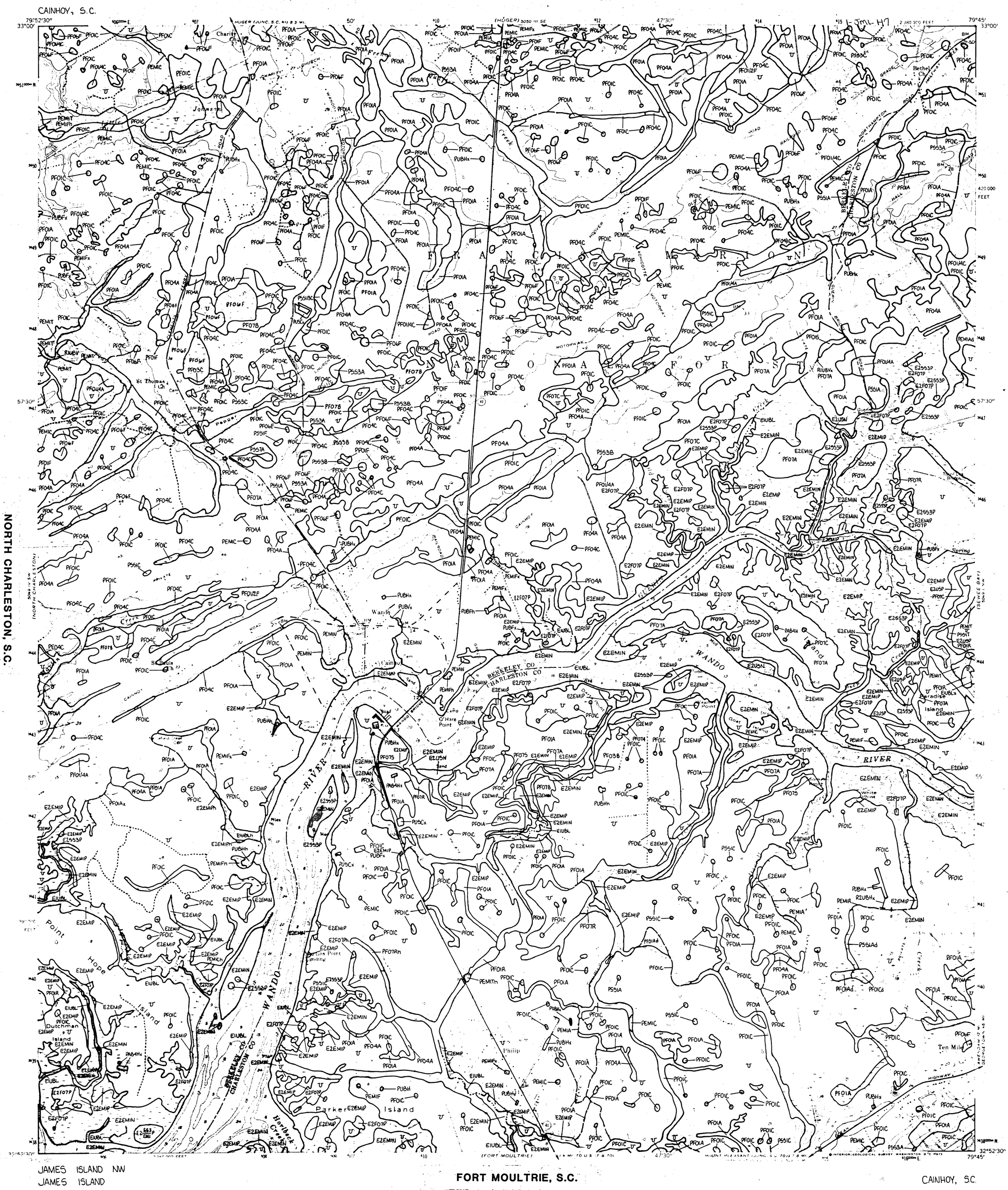
NORTH CHARLESTON, S.C.



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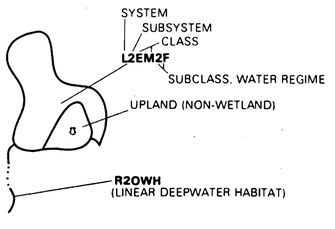

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U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

1988

SYSTEM — M — MARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL			
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM — E — ESTUARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL							
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	SB — STREAMBED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm		1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Evergreen 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*

SYSTEM — R — RIVERINE

SUBSYSTEM	1 — TIDAL		2 — LOWER PERENNIAL		3 — UPPER PERENNIAL		4 — INTERMITTENT	5 — UNKNOWN PERENNIAL	
CLASS	RB — ROCK	UB — UNCONSOLIDATED BOTTOM	*SB — STREAMBED	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	**EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*	
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent		

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

SYSTEM — P — PALUSTRINE

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS-LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

SYSTEM — L — LACUSTRINE

SUBSYSTEM	1 — LIMNETIC				2 — LITTORAL						
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	OW — *OPEN WATER/ Unknown Bottom*	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal

- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity

- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity

- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water

- a Acid
- i Circumneutral
- i Alkaline

SOIL

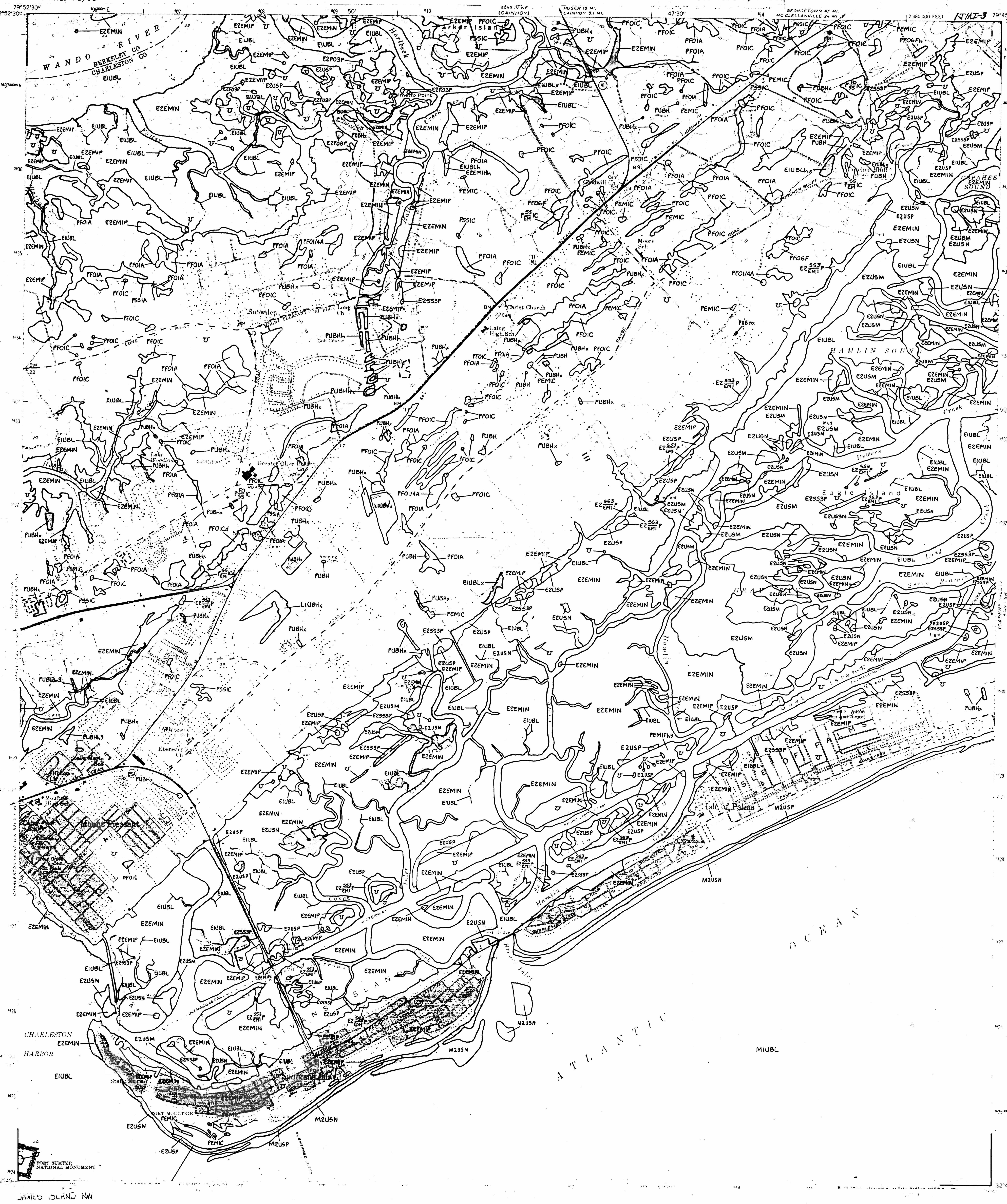
- g Organic
- n Mineral

SPECIAL MODIFIERS

- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR



SCALE 1:24 000

□ 1 acre — 10 acres — 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available For information, contact:

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.**

SYMBOLOGY EXAMPLE

SYSTEM / SUBSYSTEM / CLASS — **L2EM2F** — SUBCLASS WATER REGIME

UPLAND (NON-WETLAND)

R2OWH (LINEAR DEEPWATER HABITAT)

Ʊ — Primarily represents **upland** areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *Italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

DATE: 3 / / 83 — DATE: / /
SCALE: 1:58 000 — SCALE:
TYPE: CIR — TYPE:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1988

M — MARINE

- **1 — SUBTIDAL**
  - RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
  - UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
  - RF — REEF: 1 Coral, 3 Worm
  - OW — *OPEN WATER/ Unknown Bottom*
- **2 — INTERTIDAL**
  - AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*
  - RF — REEF: 1 Coral, 3 Worm
  - RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
  - US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

E — ESTUARINE

- **1 — SUBTIDAL**
  - RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
  - UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
  - RF — REEF: 2 Mollusc, 3 Worm
  - OW — *OPEN WATER/ Unknown Bottom*
- **2 — INTERTIDAL**
  - AB — AQUATIC BED: 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
  - RF — REEF: 2 Mollusc, 3 Worm
  - SB — STREAMBED: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
  - US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - EM — EMERGENT: 1 Persistent, 2 Nonpersistent
  - SS — SCRUB-SHRUB: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
  - FO — FORESTED: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

R — RIVERINE

- **SUBSYSTEM:** 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — UNKNOWN PERENNIAL
  - RB — ROCK: 1 Bedrock, 2 Rubble
  - UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - *SB — STREAMBED: 1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated
  - AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
  - RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
  - US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
  - **EM — EMERGENT: 2 Nonpersistent
  - OW — *OPEN WATER/ Unknown Bottom*

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**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

L — LACUSTRINE

- **1 — LIMNETIC**
  - RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
  - UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
  - OW — *OPEN WATER/ Unknown Bottom*
- **2 — LITTORAL**
  - RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
  - UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
  - AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
  - RS — ROCKY SHORE: 1 Bedrock, 2 Rubble
  - US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
  - EM — EMERGENT: 2 Nonpersistent
  - OW — *OPEN WATER/ Unknown Bottom*

P — PALUSTRINE

- RB — ROCK BOTTOM: 1 Bedrock, 2 Rubble
- UB — UNCONSOLIDATED BOTTOM: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic
- AB — AQUATIC BED: 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*
- US — UNCONSOLIDATED SHORE: 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated
- ML — MOSS-LICHEN: 1 Moss, 2 Lichen
- EM — EMERGENT: 1 Persistent, 2 Nonpersistent
- SS — SCRUB-SHRUB: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- FO — FORESTED: 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*
- OW — *OPEN WATER/ Unknown Bottom*

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal: A Temporarily Flooded; B Saturated; C Seasonally Flooded; D *Seasonally Flooded/ Well Drained*; E *Seasonally Flooded/ Saturated*; F Semipermanently Flooded; G Intermittently Exposed; H Permanently Flooded; J Intermittently Flooded; K Artificially Flooded; W Intermittently Flooded/Temporary; Y Saturated/Semipermanent/ Seasonal; Z Intermittently Exposed/Permanent; U *Unknown*

Tidal: K *Artificially Flooded*; L Subtidal; M Irregularly Exposed; N Regularly Flooded; P Irregularly Flooded; *S Temporary-Tidal; *R Seasonal-Tidal; *T Semipermanent-Tidal; *V Permanent-Tidal; U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity: 1 Hyperhaline; 2 Euhaline; 3 Mixohaline *(Brackish)*; 4 Polyhaline; 5 Mesohaline; 6 Oligohaline; 0 Fresh

Inland Salinity: 7 Hypersaline; 8 Eusaline; 9 Mixosaline; 0 Fresh

pH Modifiers for all Fresh Water: a Acid; t Circumneutral; i Alkaline

SOIL

g Organic; n Mineral

SPECIAL MODIFIERS

b *Beaver*; d *Partially Drained/Ditched*; f Farmed; h *Diked/Impounded*; r Artificial Substrate; s *Spoil*; x Excavated

NATIONAL WETLANDS INVENTORY

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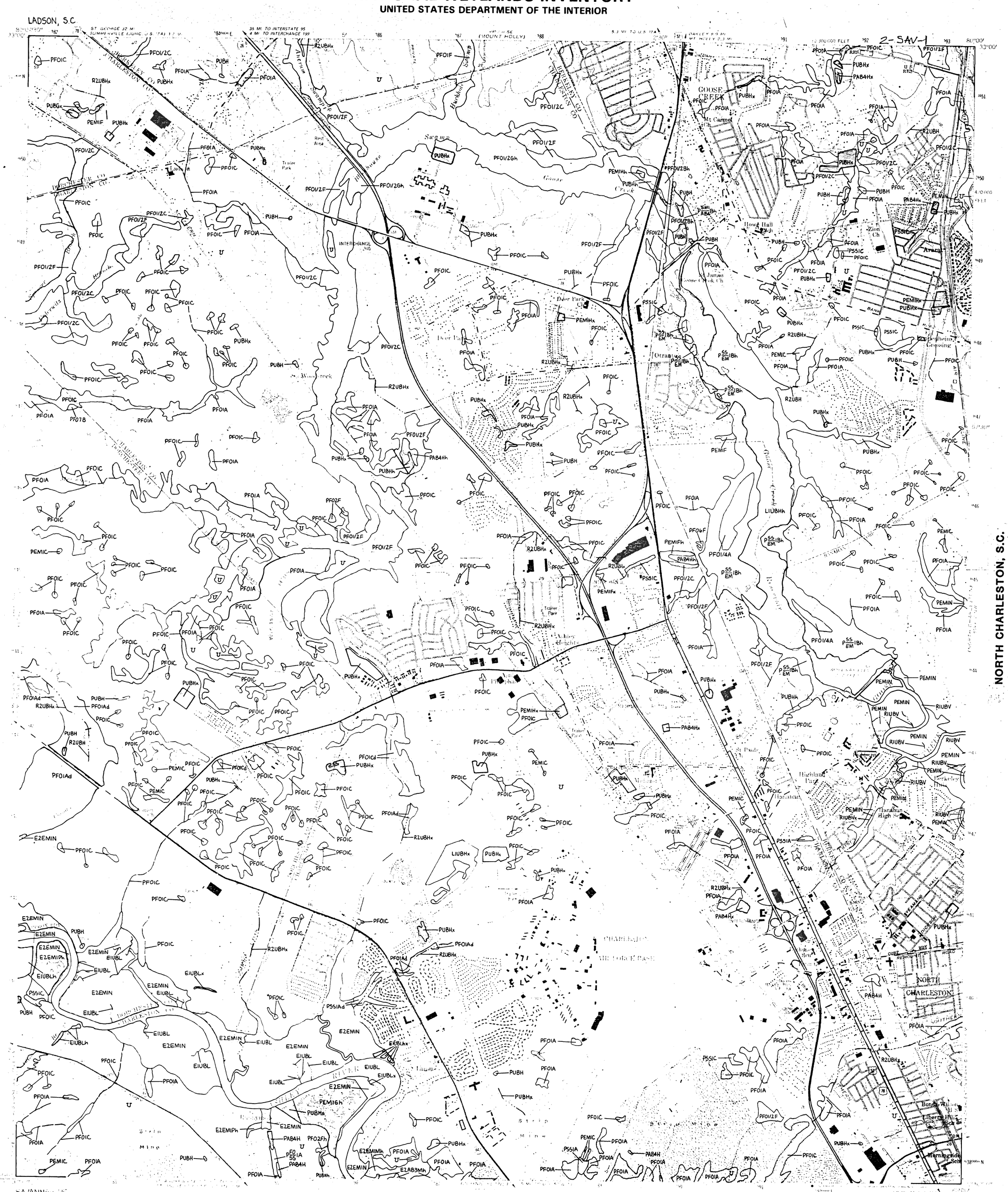

SCALE 1:24000

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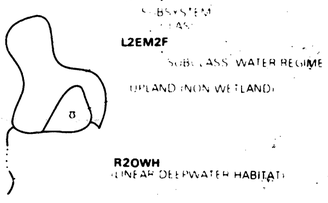

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FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory
1989

AERIAL PHOTOGRAPHY

DATE	3 83	DATE	
SCALE	1:58000	SCALE	
TYPE	CIR	TYPE	

SYSTEM: M — MARINE

SUBSYSTEM: 1 — SUBTIDAL

CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	RF REEF	OW *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	

SUBSYSTEM: 2 — INTERTIDAL

CLASS	AB AQUATIC BED	RF REEF	RS ROCKY SHORE	US UNCONSOLIDATED SHORE
Subclass	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM: E — ESTUARINE

SUBSYSTEM: 1 — SUBTIDAL

CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	RF REEF	OW *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusk 3 Worm	

SUBSYSTEM: 2 — INTERTIDAL

CLASS	AB AQUATIC BED	RF REEF	SB STREAMBED	RS ROCKY SHORE	US UNCONSOLIDATED SHORE	EM EMERGENT	SS SCRUB SHRUB	FO FORESTED
Subclass	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusk 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*

SYSTEM: R — RIVERINE

SUBSYSTEM	1 — TIDAL	2 — LOWER PERENNIAL	3 — UPPER PERENNIAL	4 — INTERMITTENT	5 — UNKNOWN PERENNIAL
CLASS	RB ROCK UB UNCONSOLIDATED BOTTOM **EM — EMERGENT OW — *OPEN WATER Unknown Bottom*	*SB — STREAMBED AB — AQUATIC BED RS — ROCKY SHORE US — UNCONSOLIDATED SHORE **EM — EMERGENT	AB — AQUATIC BED RS — ROCKY SHORE US — UNCONSOLIDATED SHORE **EM — EMERGENT	SB — STREAMBED US — UNCONSOLIDATED SHORE	US — UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 2 Nonpersistent	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated 1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface* 1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated 2 Nonpersistent	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface* 1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated 2 Nonpersistent	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated

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SYSTEM: L — LACUSTRINE

SUBSYSTEM: 1 — LIMNETIC

CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	OW *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	

SUBSYSTEM: 2 — LITTORAL

CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	RS ROCKY SHORE	US UNCONSOLIDATED SHORE	EM EMERGENT	OW *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SYSTEM: P — PALUSTRINE

CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	US UNCONSOLIDATED SHORE	ML MOSS-LICHEN	EM EMERGENT	SS SCRUB-SHRUB	FO FORESTED	OW *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

MODIFIERS

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WATER REGIME			WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS	
Non-Tidal		Tidal	Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water			
A Temporarily Flooded	H Permanently Flooded	K *Artificially Flooded*	1 Hyperhaline	7 Hypersaline	a Acid	g Organic	b *Beaver*	h *Diked/Impounded*
B Saturated	J Intermittently Flooded	L Subtidal	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral	d *Partially Drained/Ditched*	r Artificial Substrate
C Seasonally Flooded	K Artificially Flooded	M Irregularly Exposed	3 Mesohaline *(Brackish)*	9 Mixosaline	i Alkaline		f Farmed	s Spoil
D *Seasonally Flooded/ Well Drained*	W Intermittent/ Flooded-Temporary	N Regularly Flooded	4 Polyhaline	0 Fresh				x Excavated
F *Seasonally Flooded/ Saturated*	Y Saturated/ Semipermanent/ Seasonal	P Irregularly Flooded	5 Mesohaline					
F Semipermanently Flooded	Z Intermittently Exposed/ Permanent	*S Temporary-Tidal	6 Oligohaline					
G Intermittently Exposed	U *Unknown*	*R Seasonal-Tidal	0 Fresh					
		*T Semipermanent Tidal						
		*V Permanent Tidal						
		U *Unknown*						

*These water regimes are only used in tidally influenced, freshwater systems.

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

JOHNS ISLAND, S.C.

LADSON, S.C.

CHARLESTON, S.C.

SAVANNAH NE

WALTERBORO

LEGAREVILLE, S.C.

JOHNS ISLAND, S.C.

SCALE 1:24000

1 acre — 10 acres — 20 acres

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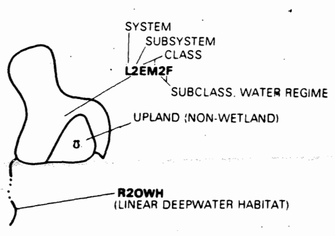

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U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory
1989

AERIAL PHOTOGRAPHY

DATE	3 83	DATE
SCALE	1:58000	SCALE
TYPE	CIR	TYPE

U – Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

SYSTEM — M — MARINE

SUBSYSTEM	1 — SUBTIDAL						2 — INTERTIDAL			
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER Unknown Bottom*	AB — AQUATIC BED	RF — REEF	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 2 Worm		1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 2 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM — E — ESTUARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL							
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	SB — STREAMBED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	SS — SCRUB SHRUB	FO — FORESTED
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm		1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*

SYSTEM — R — RIVERINE

SUBSYSTEM	1 — TIDAL	2 — LOWER PERENNIAL	3 — UPPER PERENNIAL	4 — INTERMITTENT	5 — UNKNOWN PERENNIAL
CLASS	RB — ROCK BOTTOM UB — UNCONSOLIDATED BOTTOM *SB — STREAMBED AB — AQUATIC BED RS — ROCKY SHORE US — UNCONSOLIDATED SHORE **EM — EMERGENT OW — *OPEN WATER Unknown Bottom*				
Subclass	1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated 1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface* 1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated 2 Nonpersistent				

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS and comprises the only CLASS in the INTERMITTENT SUBSYSTEM

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS

SYSTEM — L — LACUSTRINE

SUBSYSTEM	1 — LIMNETIC	2 — LITTORAL
CLASS	RB — ROCK BOTTOM UB — UNCONSOLIDATED BOTTOM AB — AQUATIC BED OW — *OPEN WATER Unknown Bottom* RS — ROCKY SHORE US — UNCONSOLIDATED SHORE EM — EMERGENT	
Subclass	1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface* 1 Bedrock 2 Rubble 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated 2 Nonpersistent	

SYSTEM — P — PALUSTRINE

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW — *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

MODIFIERS

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WATER REGIME

Non-Tidal:
- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded*
- Y Saturated-Semipermanent-Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal:
- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded*
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity:
- 1 Hyperhaline
- 2 Euhaline
- 3 Mesohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity:
- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water:
- a Acid
- t Circumneutral
- i Alkaline

SOIL
- g Organic
- n Mineral

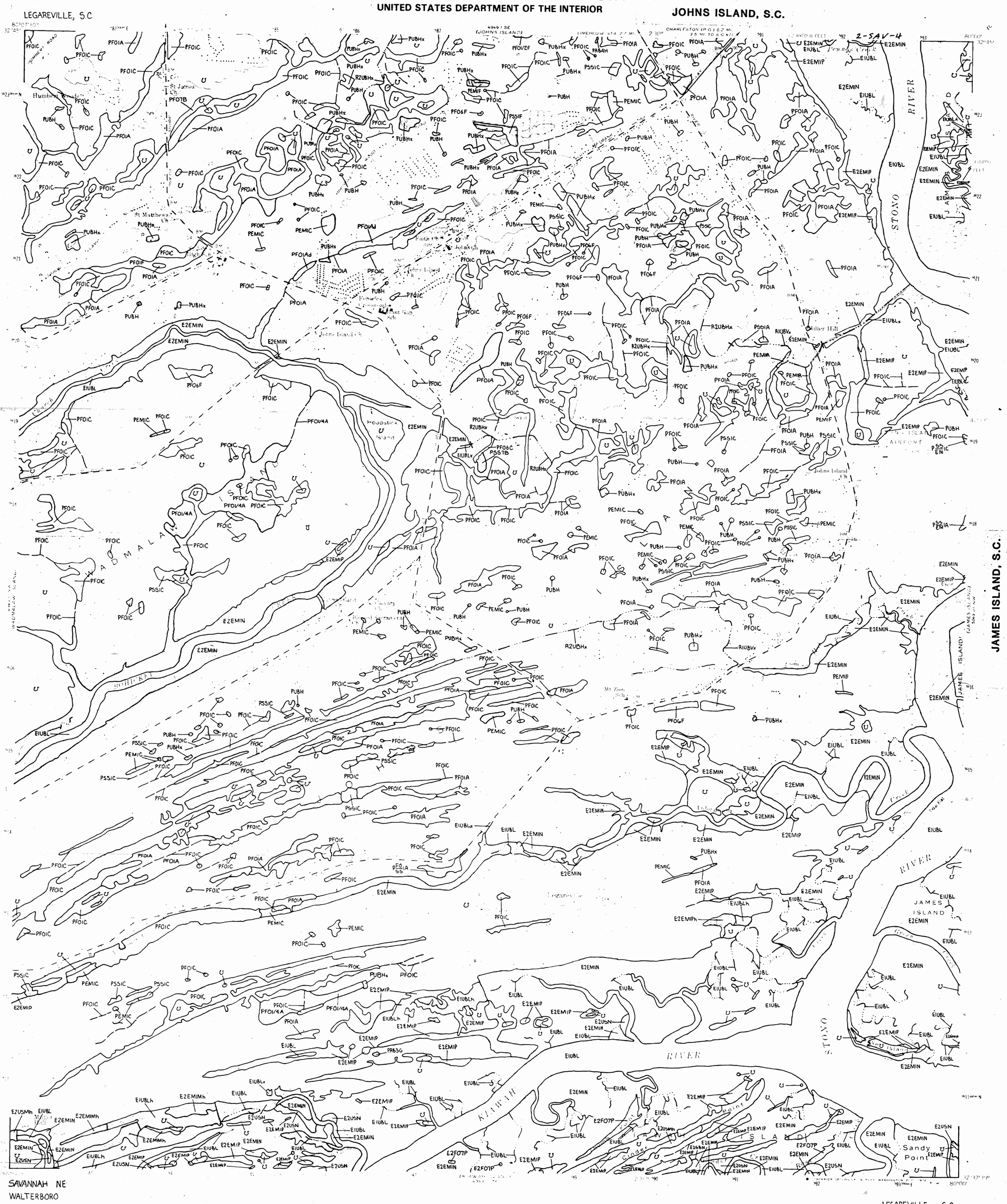
SPECIAL MODIFIERS
- b *Beaver*
- d *Partially Drained/ Ditched*
- f *Farmed*
- h *Diked/ Impounded*
- r *Artificial Substrate*
- s *Spoil*
- x *Excavated*

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

LEGAREVILLE, S.C.

JOHNS ISLAND, S.C.



SAVANNAH NE

WALTERBORO

LEGAREVILLE, S.C.

JAMES ISLAND, S.C.

SCALE 1:24 000

1 acre — 10 acres — 20 acres

ACREAGE GUIDE

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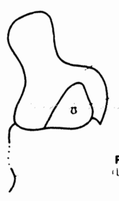

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AERIAL PHOTOGRAPHY

DATE	3/ /83	DATE ___/___/___
SCALE	1:58 000	SCALE
TYPE	CIR	TYPE

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory
1989

SYSTEM — M — MARINE

SUBSYSTEM	1 — SUBTIDAL							2 — INTERTIDAL							
CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	RF REEF	OW *OPEN WATER Unknown Bottom*			AB AQUATIC BED	RF REEF	RS ROCKY SHORE	US UNCONSOLIDATED SHORE				
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm				1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic				

SYSTEM — E — ESTUARINE

SUBSYSTEM	1 — SUBTIDAL							2 — INTERTIDAL									
CLASS	RB ROCK BOTTOM	UB UNCONSOLIDATED BOTTOM	AB AQUATIC BED	RF REEF	OW *OPEN WATER Unknown Bottom*			AB AQUATIC BED	RF REEF	SB STREAMBED	RS ROCKY SHORE	US UNCONSOLIDATED SHORE	EM EMERGENT	SS SCRUB-SHRUB	FO FORESTED		
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm				1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

SYSTEM — R — RIVERINE

SUBSYSTEM	1 — TIDAL	2 — LOWER PERENNIAL	3 — UPPER PERENNIAL	4 — INTERMITTENT	5 — UNKNOWN PERENNIAL	
CLASS	RB — ROCK	UB — UNCONSOLIDATED BOTTOM	*SB — STREAMBED	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	**EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

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SYSTEM — L — LACUSTRINE

SUBSYSTEM	1 — LIMNETIC				2 — LITTORAL					
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	OW — *OPEN WATER Unknown Bottom*	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SYSTEM — P — PALUSTRINE

SUBSYSTEM								
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS-LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

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WATER REGIME

Non-Tidal

- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent Tidal
- *V Permanent-Tidal
- U *Unknown*

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- 2 Euhaline
- 3 Mixohaline (*Brackish*)
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity

- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water

- a Acid
- t Circumneutral
- i Alkaline

SOIL

- g Organic
- n Mineral

SPECIAL MODIFIERS

- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

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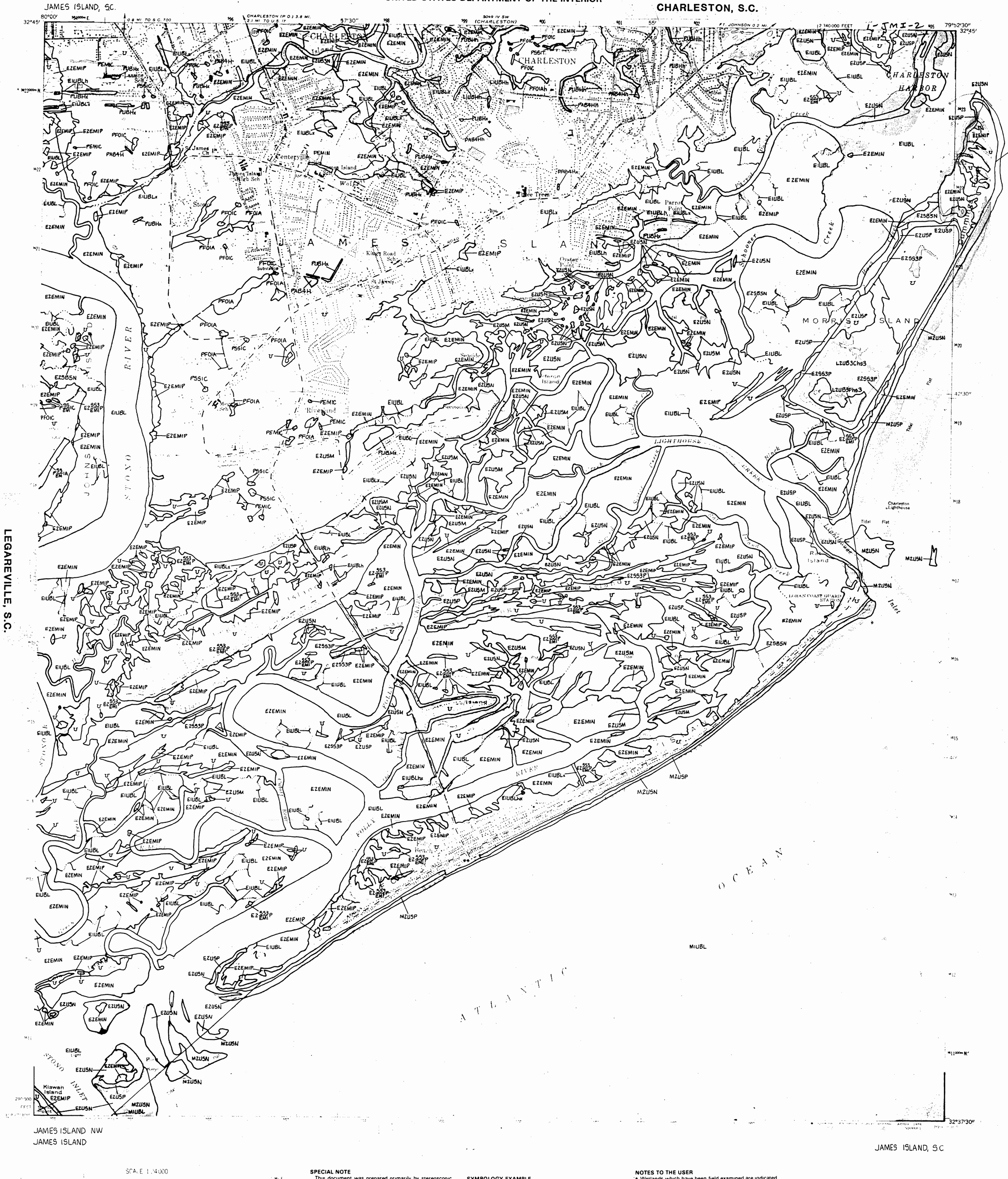
UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES ISLAND, SC.

CHARLESTON, S.C.



LEGAREVILLE, S.C.

SCALE 1:24000

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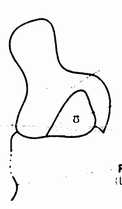

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DATE	3/ /82	DATE ___/___/___
SCALE	1:58 000	SCALE ___
TYPE	CIR	TYPE ___

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

1988

SYSTEM — M — MARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL				
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble Gravel 2 Sand 3 Mud 4 Organic	

SYSTEM — E — ESTUARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL								
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	SB — STREAMBED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm		1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad Leaved Deciduous 2 Needle Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

SYSTEM — R — RIVERINE

SUBSYSTEM	1 — TIDAL		2 — LOWER PERENNIAL		3 — UPPER PERENNIAL	4 — INTERMITTENT		5 — UNKNOWN PERENNIAL
CLASS	RB — ROCK	UB — UNCONSOLIDATED BOTTOM	*SB — STREAMBED	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	**EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

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SYSTEM — P — PALUSTRINE

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS-LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW — *OPEN WATER/ Unknown Bottom*
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SYSTEM — L — LACUSTRINE

SUBSYSTEM	1 — LIMNETIC				2 — LITTORAL						
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	OW — *OPEN WATER/ Unknown Bottom*	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

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- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated-Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems

WATER CHEMISTRY

Coastal Halinity

- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity

- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water

- a Acid
- i Circumneutral
- i Alkaline

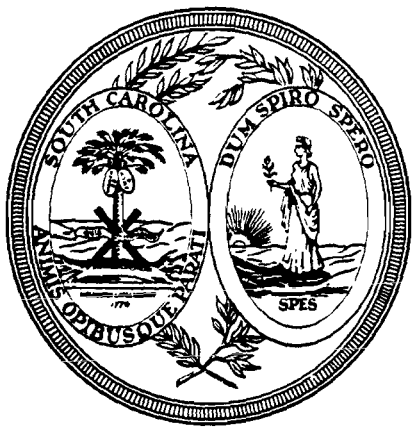
SOIL

- g Organic
- n Mineral

SPECIAL MODIFIERS

- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

A Review of Charleston Harbor Water Quality Data 1974 - 1987



Technical Report No. 002-89

By

David Chestnut

Bureau of Water Pollution Control
Office of Environmental Quality Control
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

A REVIEW OF CHARLESTON HARBOR WATER QUALITY DATA 1974 - 1987

By

David Chestnut

South Carolina Department of Health
and Environmental Control

Technical Report No. 002-89

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ABSTRACT

Water quality was investigated at fifteen SCDHEC ambient monitoring stations located in the Charleston Harbor estuary from 1974 through 1987. Improvements in various water quality parameters were detected during this time period at several of the monitoring stations considered in this report. Part of the improvement may be attributable to increased control of point source discharges through the NPDES permitting system. Water quality is presently meeting appropriate State standards and USEPA criteria at most of the stations examined. The need for additional sampling is indicated in the upper Ashley River and Shem Creek.

Changes in analytical technology, along with the institution of backround interference corrections, have resulted in increased accuracy of measurement for several parameters of interest, resulting in a more exact picture of conditions in the estuary. In particular, concentrations of nickel, cadmium, chromium, lead, copper, zinc, and mercury in the Harbor waters appear to have been over estimated under the old analytical procedures. The trends that were detected are actually an artifact of the improved analytical accuracy. Comparative data from all marine stations in the SCDHEC ambient monitoring network indicate that real changes have occurred in the concentrations of these metals in the Harbor relative to other coastal stations. In the past concentrations of these heavy metals had been higher in Charleston Harbor than other coastal areas. Concentrations of these metals are no longer elevated above levels seen at other SCDHEC monitoring stations in the marine environment. Likewise, the number of excursions beyond USEPA criteria for these heavy metals have greatly declined over the period examined. The routine heavy metals analyses indicate that these metals concentrations are not unusually high.

Fecal coliform bacteria and five-day biochemical oxygen demand (BOD) showed widespread significant declines in the Harbor system. Fecal coliform

bacteria appear to be meeting State standards at all stations examined. A high frequency of dissolved oxygen violations were noted near the mouth of Shem Creek and in the upper Ashley River. A high frequency of elevated five-day biochemical oxygen demand concentrations were also noted in these areas. Compared to State standards, dissolved oxygen was acceptable at all other stations examined.

There was an almost universal trend for increasing pH at the stations examined, with values meeting State standards at all stations examined. Nutrient levels were highly variable throughout the estuary system with no clear-cut patterns. The upper Ashley River exhibited several significantly elevated nutrient parameters. Ammonia concentration was significantly greater at Shem Creek than at the other SCDHEC marine monitoring stations.

The only organic chemical detected at any of the Harbor estuary stations was phenol in the Cooper River below the mouth of Goose Creek. This compound was only detected once during the period examined and does not appear to be a chronic condition.

In sediments, chromium appeared as the parameter that most frequently had mean concentrations greater than other DHEC ambient marine monitoring stations. Very few pesticides or other organic compounds were detected in the sediments from the Charleston Harbor stations.

In general, the parameters which have been routinely monitored in Charleston Harbor have shown improvement during the time period examined. Water quality is presently meeting appropriate State standards and USEPA criteria at most of the stations examined.

INTRODUCTION

In an effort to evaluate water quality in the state's aquatic environment, the South Carolina Department of Health and Environmental Control (SCDHEC) operates a statewide network of ambient monitoring stations (SCDHEC, 1989). This network consists of 196 primary stations sampled monthly, and 355 secondary stations sampled during the months of May through October, only. Of these 551 stations, 78 are considered marine stations, being located in waters with salinities reflecting the influence of sea water. These monitoring activities are directed towards determining long-term water quality trends as well as current water quality conditions. The monitoring data are also used in the process of formulating permit limits for wastewater discharges with the goal of maintaining state and federal water quality standards and criteria in the receiving streams. These standards and criteria define the instream chemical concentrations which provide for protection and reproduction of aquatic flora and fauna, determine the use classification of each water body, and serve as instream limits for the regulation of wastewater discharges or other activities. Because of the development and recreation pressures associated with the Charleston Harbor estuary, SCDHEC has a high concentration of primary and secondary monitoring stations in the Charleston Harbor area. This report represents a review of water quality data collected by SCDHEC at fifteen of these stations in Charleston County (Table 1 and Figure 1) from 1974 through the end of 1987. The general parametric coverage and sampling frequency are given in Table 2.

The Ashley, Cooper and Wando Rivers converge at Charleston, South Carolina to form the Charleston Harbor estuary. Charleston Harbor is the site of one of the largest shipping ports and business centers of the eastern seaboard. As such it is experiencing rapid population and industrial expansion. This rapid growth places increasing pressure on the Charleston Harbor estuary as a receiving stream for the waste products associated with

TABLE 1. CHARLESTON HARBOR STATIONS

Station	Description
Ashley River	
MD-049	Ashley River at Magnolia Gardens.
MD-135	Ashley River at S.C. Route 7, North bridge (secondary station).
MD-052	Ashley River at site of old South Atlantic Line Railroad bridge.
MD-020	Mouth of Wappoo Creek between channel markers 3 and 4.
MD-034	Right bank of the Ashley River between mouth of Wappoo and Dills Creeks.
Cooper River	
MD-044	Cooper River below mouth of Goose Creek at channel marker 60.
MD-045	Cooper River above mouth of Shipyard Creek at channel marker 49.
MD-046	Cooper River under Grace Memorial Bridge.
MD-047	Town Creek (west side of Drum Island) under Grace Memorial Bridge.
Wando River	
MD-115	Wando River at S.C. Route 41.
MD-198	Wando River between Rathall and Hobcaw Creeks.
Charleston Harbor	
MD-071	Shem Creek at U.S. Route 17 bridge.
MD-070	Abandoned bridge over The Cove end of Pitt Street, Mt. Pleasant.
MD-165	Charleston Harbor at Fort Johnson pier, Marine Science Laboratory.
MD-048	South channel of Charleston Harbor off Fort Johnson Quarantine Station bell buoy 28.

Figure 1. Charleston Harbor Sampling Station Locations

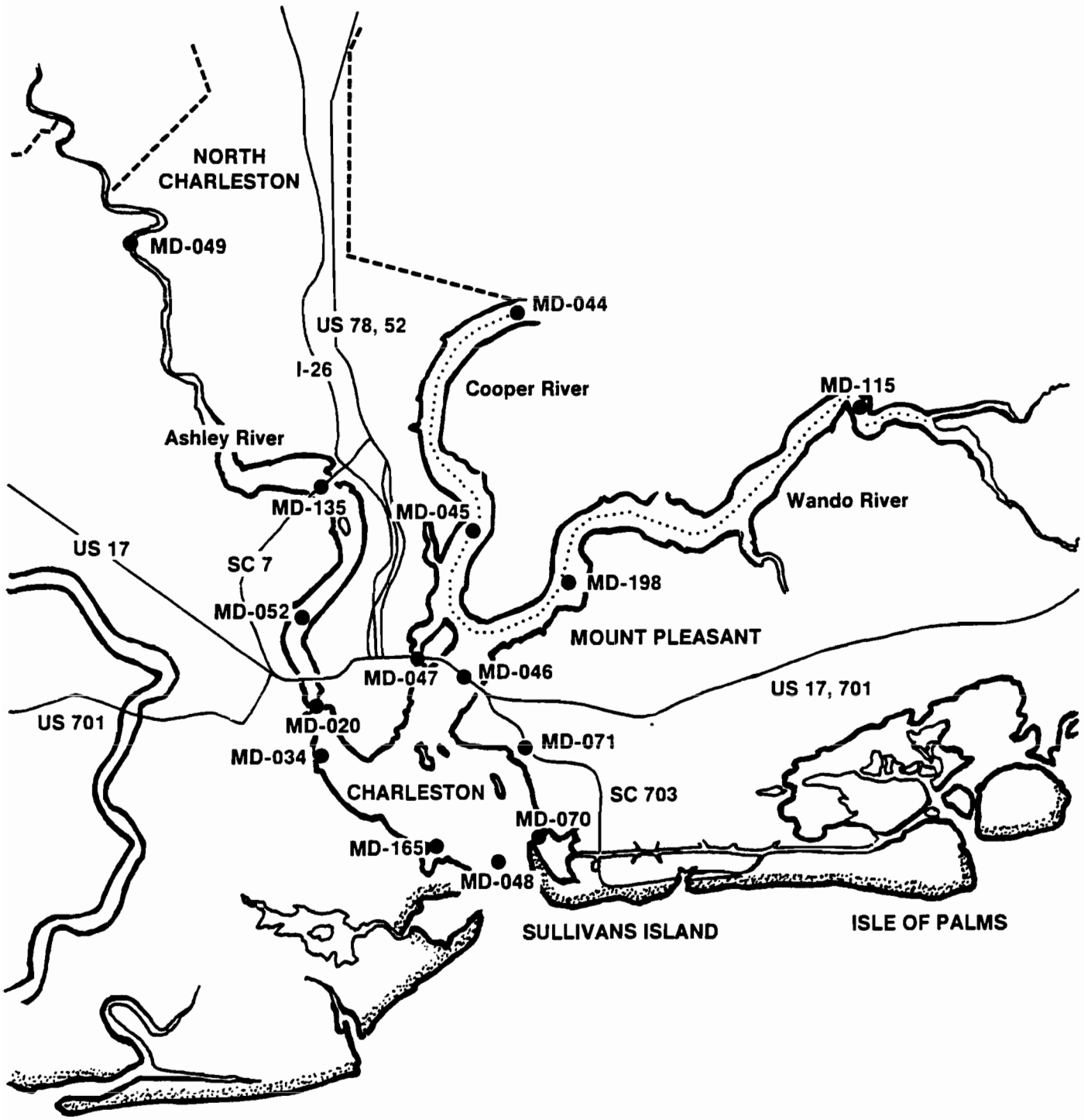

TABLE 2. PARAMETRIC COVERAGE AND SAMPLING FREQUENCY

Station No.	Temp	DO	pH	Salt	Condt	TSS	Turb	Color	Trans	Alkl	Hard	BOD_5	NH_3 NH_4	NO_2 NO_3	TKN	TP	TOC	Cl	Phen	Metals	Pest PCBs	Other Org*	Total Coli	Fecal Coli	Flow	Sed	Sed Org*
ASHLEY RIVER																											
MD-049	M	M	M	M	M		M			M	A	M	M	M	M	M	Q	M		Q				M	M		
MD-135	M	M	M	M	M		M					M		M		M								M			
MD-052	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M		A	
MD-020	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
MD-034	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
COOPER RIVER																											
MD-044	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
MD-045	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M		A	
MD-046	M	M	M	M	M		M			M	A	M	M	M	M	M	Q	M		Q				M			
MD-047	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
WANDO RIVER																											
MD-115	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M	M	A	
MD-198	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
CHARLESTON HARBOR																											
MD-071	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M	M		
MD-070	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
MD-165	M	M	M	M	M		M			M	A	M	M	M	M	M	Q			Q				M			
MD-048	M	M	M	M	M	M	M		M	M	A	M	M	M	M	M	M			Q	A	A		M		A	A

M = monthly, Q = quarterly, A = annually

*Base-Neutral and Acid Extractable, and Volatile Organics

Temp = temperature
DO = dissolved oxygen
TSS = total suspended solids
Phen = phenols
Pest = pesticides and PCBs
Flow = flow or stage meas.
TKN = total Kjeldhal nitrogen

Salt = salinity
Condt = conductivity
Hard = hardness
Turb = turbidity
Other = other organics
Cl = chlorides
pH = pH

Trans = transparency
Alk = alkalinity
TP = total phosphorus
TOC = total organic carbon
NH_3 NH_4 = ammonia
NO_2 NO_3 = nitrate-nitrite

Sed = sediment (routine)
Sed Org = sediment organics
Metals = heavy metals
Fecal Coli = fecal coliform
Total Coli = total coliform
BOD_5 = 5-day biochemical oxygen demand

urban development. In recent years several citizens groups have formed out of concerns over water quality and the preservation of natural resources. This report will assist in putting these concerns in perspective by reviewing historical water quality data from SCDHEC trend monitoring sites to elucidate long-term trends and current conditions.

METHODS AND MATERIALS

Dissolved oxygen, temperature, salinity, and specific conductance were measured monthly at each station *in situ* according to standard procedures (SCDHEC, 1987) as dictated by their primary or secondary status. At several stations these parameters were sampled as a water column profile, with measurements being made at a depth of 0.3 meters below the water surface and at one meter intervals to the bottom. At other stations these parameters were measured only at a depth of 0.3 meters which was considered a surface measurement. Other water quality parameters, i.e., nutrients, metals, biochemical oxygen demand, bacteria, pesticides and other organics, were routinely sampled at the surface (depth of 0.3 m) monthly as dictated by their primary or secondary status. The primary and secondary status of some stations changed during the review period 1974 through 1987, and additional samples and parameters may have been collected at some stations at other times as part of various special studies. Station MD-135 is presently a secondary monitoring station, all others considered are currently classed as primary stations. All water and sediment samples were collected and analyzed according to standard procedures (SCDHEC, 1987; SCDHEC, 1981).

Surface data (0.3 m or less) from each station from 1974 through 1987 were analyzed for long-term trends using a modification of Kendall's tau (Bauer, Glauz, and Flora, 1984; Hirsch, Slack, and Smith, 1982; Smith, Hirsch, and Slack, 1982; Smith, Alexander, and Wolman, 1987). The basic methodology utilized was that of Smith *et al* (1982), however, certain screening procedures were instituted to handle changing detection limits. One of the advantages of

the seasonal Kendall test is that values reported as being below detection limits (DL) are valid data points in this nonparametric procedure, as they are all considered to be tied at the DL value. When the DL has changed during the period of interest, Hirsch et al (1982) stated that all values must be considered to be tied at the highest DL occurring during that period.

During the period examined in this report, DL for some parameters have been radically lowered due to the advent of more sensitive analytical techniques. In many instances, converting all values below DL to the highest DL would have completely obscured any trend that may have been present. Since the highest DL was associated with the oldest data and was generally in effect for a shorter time period than the lower DL, it was decided that values reported as below the old DL would be deleted from the data set prior to trend analysis. Since it is possible to measure concentrations equal to the value of the DL, values reported as <DL were reduced by subtraction of a constant so that they would remain tied with each other, but be less than the values equal to the DL.

The test statistic calculated in the seasonal Kendall test is the one-sided standard normal deviate, Z. The calculated Z score can be positive or negative, with the sign of the Z score indicating the direction of the trend. Thus, a resultant probability <0.05 was considered to indicate a significant trend with the sign of the test statistic indicating whether it was an increasing or decreasing trend. This is the functional equivalent of a two-sided test at a significance level of 0.10. One-sided probabilities are reported in Table 3. To obtain the two-sided probability, simply double the p values in Table 3.

Some important parameters, like sediment measurements or nutrients in water, do not have state standards or federal criteria, although the USEPA is presently working on the development of sediment criteria. In order to put these parameters in perspective, the monitoring data from all SCDHEC sampling

stations in marine locations was summarized, regardless of depth, for the period from 1974 through 1987 and was used for comparison to the Charleston Harbor data. For these parameters the mean values from each harbor station, calculated regardless of depth, were compared to the pooled marine station means using the SAS T-TEST procedure (SAS Institute, 1985).

The T-TEST procedure assumes that the variances of the groups being compared are equal and the SAS PROC T-TEST also calculates the F test statistic which tests this assumption. The PROC T-TEST produces two values of the t statistic; the usual t statistic, and the approximate t for use when the variances are unequal (see SAS Institute, 1985 for more details). The associated probability for a two-tailed hypothesis is printed for both t values. The appropriate t statistic to be used is determined by results of the F test. The hypothesis of interest in this report is whether or not the mean Harbor station concentrations were greater than the mean pooled data for the entire South Carolina coast, which is a one-tailed hypothesis. Therefore, the two-tailed probabilities were converted to one-tailed values by dividing by two. A one-tailed probability less than or equal to 0.05 was considered to indicate a significant difference.

RESULTS AND DISCUSSION

Trend Analysis

The results of the trend analysis are presented in Table 3. In this table "I" indicates a significant increasing trend, "D" is a significant decreasing trend, and "p" is the one-sided probability with the level of significance equal to 0.05. Only statistically significant trends are shown in Table 3, while blanks in the table indicate no significant trend was indicated by the analysis.

Several parameters show remarkably consistent trends across stations. Fourteen of the fifteen stations examined for trends showed increasing pH (Table 3). Thirteen of the fifteen stations exhibited significant declines in

TABLE 3. SUMMARY OF TREND ASSESSMENT
FOR CHARLESTON HARBOR, 1974 - 1987

	STATION							
Parameter	MD-044	MD-045	MD-046	MD-047	MD-071	MD-070	MD-165	MD-048
DO						I p=0.0466		
BOD_5		D p=0.0053	D p<0.0001	D p=0.0007	D p<0.0001	D p<0.0001	D p<0.0001	D p<0.0001
pH	I p=0.0320	I p=0.0263	I p<0.0001	I p<0.0001	I p=0.0001	I p<0.0001	I p=0.0012	I p=0.0009
NH_3/NH_4	I p=0.0131							
TKN	I p=0.0442	I p=0.0216				D p=0.0091		D p=0.0411
NO_2/NO_3	D p=0.0143	D p=0.0153	D p=0.0255			D p=0.0203	D p=0.0149	D p=0.0095
TP		I p=0.0302				D p=0.0245		
TOC				D p=0.0320		D p=0.0285		D p=0.0006
Fecal			D p=0.0450	D p=0.0178		D p=0.0218	D p=0.0002	D p=0.0001
Cd	D p=0.0263	D p=0.0233	D p<0.0001	D p=0.0242	D p=0.0128	D p=0.0224	D p=0.0226	D p=0.0224
Cr								
Cu			D p=0.0084	D p=0.0286	D p=0.0152	D p=0.0103		D p=0.0237
Pb	D p=0.0033	D p=0.0034	D p=0.0023	D p=0.0002	D p=0.0048	D p=0.0216	D p=0.0286	D p=0.0130
Ni	D p=0.0007	D p=0.0002	D p=0.0003	D p=0.0001	D p=0.0002	D p=0.0002	D p=0.0018	D p=0.0040
Zn	D p=0.0021	D p<0.0001	D p=0.0001	D p=0.0034	D p=0.0001	D p<0.0001	D p<0.0001	D p=0.0002
Hg	D p=0.0003	D p<0.0001	D p=0.0001	D p=0.0001	D p<0.0001	D p<0.0001	D p<0.0001	D p<0.0001

Continued on next page.

D = Significant declining trend
I = Significant increasing trend
p = One-sided significance level

TABLE 3 (continued)

	STATION						
Parameter	MD-049	MD-135	MD-052	MD-020	MD-034	MD-115	MD-198
DO			I p=0.0451	I p=0.0022			
BOD_5		D p=0.0123	D p=0.0112	D p=0.0003	D p=0.0001	D p<0.0001	D p<0.0001
pH		I p=0.0061	I p=0.0006	I p<0.0001	I p=0.0001	I p<0.0001	I p<0.0001
NH_3/NH_4	I p=0.0154		I p=0.0359	I p=0.0153	I p=0.0117		
TKN	I p=0.0148				I p=0.0400	I p=0.0365	
NO_2/NO_3	I p=0.0011		D p=0.0045	D p=0.0204		D p<0.0001	D p=0.0001
TP	I p=0.0010				I p=0.0231	D p=0.0245	
TOC							
Fecal			D p=0.0361	D p=0.0044	D p=0.0159		
Cd	D p=0.0112		D p=0.0213		D p=0.0224	D p=0.0054	D p=0.0422
Cr							
Cu						D p=0.0008	D p=0.0471
Pb			D p=0.0022	D p<0.0001	D p=0.0066		
Ni	D p=0.0021		D p=0.0007	D p=0.0016	D p=0.0031	D p=0.0076	D p=0.0013
Zn	D p<0.0001		D p=0.0001	D p<0.0001	D p=0.0001	D p=0.0007	D p<0.0001
Hg	D p<0.0001		D p<0.0001	D p<0.0001	D p<0.0001	D p=0.0010	D p=0.0024

D = Significant declining trend
I = Significant increasing trend
p = One-sided significance level

five-day biochemical oxygen demand (BOD). There were numerous significantly decreasing trends in the various heavy metals considered. Fecal coliform bacteria also showed many significant declines over the period examined. Note that station MD-135 is a secondary station which has limited parameter coverage, so for several parameters the data was considered to be too sparse (for most heavy metals <5 samples) to allow for an accurate trend assessment (Table 4, ID = Insufficient Data).

There were very few significant trends in dissolved oxygen (DO), which is the single most important parameter for the survival and maintenance of fish and aquatic invertebrates. Significant increases in DO were detected at MD-070, The Cove at Mt. Pleasant, and at MD-052 and MD-020 in the lower portion of the Ashley River. There were no significant declines in DO at any of the stations examined.

Five-day biochemical oxygen demand (BOD) is a measure of the amount of DO consumed by the decomposition of carbonaceous matter in water. The BOD test indicates the amount of biologically oxidizable carbon that is present in wastewater or in natural water. The decrease in five-day biochemical oxygen demand (BOD) at most stations is probably due, at least in part, to the BOD limits placed upon point source dischargers through the National Pollutant Discharge Elimination System (NPDES) permits issued by SCDHEC. The declines in BOD also resulted in an increase in dissolved oxygen (DO) at MD-052 and MD-020 in the Ashley River and MD-070 in The Cove. The issuance and enforcement of NPDES permits may also be responsible for at least some of the decreases in fecal coliform bacteria detected. There is no ready explanation for the almost universal increasing trend in pH readings.

Nutrients, in terms of environmental water quality, refers to phosphorus and nitrogen. Both nitrogen and phosphorus serve as primary elements in the growth and reproduction of aquatic plants. Other than oxygen-demanding materials, nutrients are the most common constituents discharged to the

TABLE 4. SUMMARY OF TREND ASSESSMENT
FOR CHARLESTON HARBOR, 1974 - 1987

	STATION							
Parameter	MD-044	MD-045	MD-046	MD-047	MD-071	MD-070	MD-165	MD-048
DO	119* 1975	139 1975	139 1975	122 1975	122 1975	122 1975	125 1975	141 1975
BOD_5	125 1974	129-1 1974	128 1974	126 1974	134 1974	130 1974	130 1974	124 1974
pH	127 1975	139 1975	134 1975	130 1975	138 1975	134 1975	135 1975	153 1975
NH_3/NH_4	112-1 1975	130-4 1974	124-1 1974	110-1 1974	114-1 1974	112-1 1975	115-1 1974	108 1974
TKN	105 1975	115-1 1974	117 1974	107-1 1974	110-1 1974	108 1975	115-1 1975	108-2 1975
NO_2/NO_3	123 1974	141 1974	138 1974	122 1974	129 1974	124 1974	127 1974	121 1974
TP	110-3 1975	129-4 1974	127-4 1975	110-4 1975	114-3 1975	112 1975	115-1 1975	106-1 1975
TOC	42 1976	62 1976	62 1974	41 1974	45 1976	43 1976	47 1974	88 1974
Fecal	128-1 1974	145 1974	143 1974	124 1974	134 1974	129 1974	131 1974	128 1974
Cd	28 1978	31 1978	32 1978	29 1978	32 1977	32 1978	34 1978	31 1978
Cr	28 1978	48 1978	48 1978	29 1978	32 1977	31 1978	34 1978	30 1978
Cu	34-8 1979	54-22 1981	53-21 1979	35-9 1979	38-10 1977	38-10 1979	40-12 1981	37-9 1978
Pb	28 1978	48 1978	48 1978	29 1978	32 1977	32 1978	34 1978	31 1978
Ni	34-9 1981	37-8 1978	37-6 1978	35-4 1978	38-1 1977	38-1 1978	40-2 1978	37 1978
Zn	34-3 1978	54-12 1978	53-7 1978	35-3 1978	38-3 1977	38-7 1978	40-7 1979	37-6 1978
Hg	56-8 1974	77-8 1974	78-6 1974	59-10 1974	63-8 1974	54-6 1974	57-3 1974	53-5 1974

* 1st Row = # of samples collected - # dropped due to changing DL.
2nd Row = earliest year considered in trend analysis.

TABLE 4 (continued)

	STATION						
Parameter	MD-049	MD-135	MD-052	MD-020	MD-034	MD-115	MD-198
DO	111* 1975	68 1975	132 1975	128 1975	124 1975	122 1975	139 1975
BOD_5	149 1974	68 1974	126 1974	126 1974	123 1974	143 1975	124 1974
pH	146 1975	74 1975	139 1975	134 1975	130 1975	138 1975	132 1975
NH_3/NH_4	147-2 1974	24 1974	118 1974	112-2 1974	111 1974	142-2 1976	124-1 1974
TKN	132-1 1975	26 1974	115-1 1975	115-2 1974	108-1 1975	129 1976	108-1 1975
NO_2/NO_3	145 1974	65 1974	128 1974	129 1974	122 1974	152 1974	131 1974
TP	134 1974	45-1 1975	116-1 1975	114-2 1974	108-2 1975	139 1976	120-2 1975
TOC	53 1974	ID	47 1974	46 1974	47 1974	66 1976	59 1976
Fecal	141 1974	64 1974	128 1974	132 1974	130 1974	153 1975	139 1974
Cd	37 1977	ID	33 1978	38 1978	32 1978	36 1977	28 1978
Cr	38 1977	ID	33 1978	32 1978	32 1978	55 1977	44 1978
Cu	47-12 1981	ID	43-11 1981	38-10 1978	38-11 1981	61-22 1979	50-19 1979
Pb	38 1977	ID	33 1978	38 1978	32 1978	55 1977	44 1978
Ni	43-7 1977	ID	43-1 1978	38 1978	38 1978	42-3 1977	34-1 1978
Zn	47-3 1977	ID	43-3 1978	35-8 1978	38-4 1978	61-8 1977	50-8 1978
Hg	70-8 1974	21 1974	63-7 1974	65-7 1974	59-8 1974	71-5 1974	68-6 1974

* 1st Row = # of samples collected - # dropped due to changing DL
2nd Row = earliest year considered in trend analysis
ID = Insufficient data for trend analysis

environment by man's activities, through wastewater facilities and by agricultural, residential, and stormwater runoff. In general, increasing nutrient concentrations are undesirable because of the potential for nuisance growth of aquatic vegetation and algal blooms which may in turn deplete dissolved oxygen and result in fish kills.

The forms of nitrogen routinely analyzed at SCDHEC stations are ammonia (NH_3/NH_4), total Kjeldhal nitrogen (TKN), and nitrite-nitrate nitrogen (NO_2/NO_3). TKN assays the amount of organic nitrogen and ammonia in a sample. NO_2/NO_3 measures the amount of nitrate and nitrite present in a sample. Nitrate is the end product of aerobic decomposition of ammonia and is a primary aquatic plant nutrient. Total phosphorus (TP) was measured to determine the phosphorus concentration of the estuarine system. This test includes all of the various species of phosphorus (organic, inorganic; dissolved, particulate) present in a sample.

There were no consistent trends in nutrients, some increased and some decreased, sometimes at the same station. At MD-070, The Cove at Mt. Pleasant, three of the four nutrient parameters showed significant declines. In the upper Ashley River station MD-049 near Magnolia Gardens showed significant increasing trends in all four of the nutrient parameters. There is no obvious explanation for these trends. Increases noted in the nutrients in the lower Ashley River (MD-034) are most likely due to changes in sewage effluents. The Charleston Public Works Plum Island wastewater treatment facility began discharging in the vicinity of MD-034 in 1971. Increasing trends in nutrient concentration are not in themselves reason for concern. The effects of such increases are dependent upon the magnitude of the increase, the resulting concentration, local hydrologic conditions, and the ultimate sink for the nutrient load.

The almost universal detection of declining concentrations in heavy metals is actually an artifact of changes in analytical technique. Until July

of 1984 Flame Atomic Absorption was employed as the analytical technique for metals in water, without backround interference correction. Beginning in July 1984 the technique was changed to Simultaneous Inductively Coupled Argon Plasma Emission Spectrometery (ICP). Since the changeover was completed all metals have been measured more accurately with backround interference correction. A comparison of the raw data before and after the change in technique shows a radical decrease in routine metals concentrations, presumably due to the increased accuracy resulting from backround interference corrections.

During the period of transition between Flame Atomic Absorption and ICP, problems were discovered with the implementation of the backround correction for salinity interference for cadmium, chromium, and lead. It was determined that all of the water concentrations measured for Cd, Cr, and Pb between July 2, 1984 and December 17, 1985 had not received appropriate backround corrections. Therefore, these data were deleted from the data set prior to the trend analysis. These erroneous data have also been removed from STORET.

During the trend period the detection limits for several metals were lowered allowing for more accurate measurements at lower concentrations during the latter part of the trend period. This, coupled with the inherently increased accuracy of the ICP analyses with interference correction, has resulted in the appearance of declining trends in metals concentrations. However, what the data actually reflect is how the lack of backround corrections under Flame Atomic Absorption resulted in the overestimation of the actual metals concentrations.

Water Quality Standards

Simply because the concentration of a certain parameter shows a significant trend does not necessarily mean that the water meets acceptable water quality standards. The presence of a significant trend serves primarily to indicate improvement or degradation of a resource over time. The degree of

improvement or degradation can be evaluated by comparing the individual parametric values to state water quality standards or federal water quality criteria. This determines whether or not a particular water body meets its use classification.

EPA criteria are generally specified as a four-day average and a one-hour average (USEPA, 1986) which are not to be exceeded more than once every three years. At the majority of the Charleston Harbor stations, samples for analysis are collected as single grab samples once per month, quarter, or year, depending on the parameter. For this reason it was considered inappropriate to compare this single grab sample to the four-day average criterion. Therefore, when comparing the concentration of parameters in Charleston Harbor waters to EPA criteria, only the one-hour average criterion was used. The USEPA does not define the sampling method other than indicating that it should be "representative". The grab sample method is considered to be representative for the purpose of indicating excursions relative to criteria.

The USEPA heavy metals criteria are based on the acid soluble fraction of metals in water, although there is no USEPA accepted analytical method for acid soluble metals analysis. The analysis used by SCDHEC measures total metal concentration. This is a more conservative approach from a public health standpoint, as total metal concentration is always greater than the acid soluble fraction. This approach estimates worst case conditions, with the result of detecting many more excursions beyond criteria than if only the acid soluble fraction were measured. However, it guarantees that any concentrations measured below the criteria value are definitely safe. Many excursions beyond the criteria were noted (Table 5). Zinc, nickel, and lead exhibited the highest incidence of excursions. Copper also had a high frequency of values above the criterion. However, these data also reflect the effect of the change in analytical methodology when the number and percentage of criteria excursions since the ICP technique was initiated are considered.

TABLE 5. SUMMARY OF CHARLESTON HARBOR HEAVY METALS CONCENTRATIONS EXCEEDING USEPA CRITERIA 1974 - 1987

		Nickel		Zinc		Cadmium	
	Criteria	(75 ug/l)		(95 ug/l)		(43 ug/l)	
	Station	Total	Since ICP	Total	Since ICP	Total	Since ICP
Ashley River	# EXC.*	13	0	18	1	0	0
	MD-049 N	44	17	48	17	30	8
	%	30	0	38	6	0	0
	# EXC.	0	0	0	0	0	0
	MD-135 N	5	5	5	5	0	0
	%	0	0	0	0	0	0
	# EXC.	24	0	14	3	1	0
	MD-052 N	43	18	43	18	33	8
	%	56	0	33	17	3	0
	# EXC.	26	1	9	0	2	0
	MD-020 N	39	14	39	14	39	8
	%	67	7	23	0	5	0
	# EXC.	25	0	12	1	1	0
	MD-034 N	39	14	39	14	33	8
	%	64	0	31	7	3	0
Cooper River	# EXC.	3	0	10	2	0	0
	MD-044 N	36	14	36	14	30	8
	%	8	0	28	14	0	0
	# EXC.	12	0	34	0	0	0
	MD-045 N	39	14	73	14	33	8
	%	31	0	47	0	0	0
	# EXC.	19	0	41	1	1	0
	MD-046 N	40	14	74	14	35	8
	%	48	0	55	7	3	0
	# EXC.	15	0	14	3	1	0
	MD-047 N	37	14	37	14	31	8
	%	41	0	38	21	3	0
Wando River	# EXC.	24	1	32	2	0	0
	MD-115 N	42	14	61	14	36	8
	%	57	7	52	14	0	0
	# EXC.	23	0	33	0	2	0
	MD-198 N	37	13	70	13	31	7
	%	62	0	47	0	6	0
Charleston Harbor	# EXC.	25	1	18	1	2	0
	MD-071 N	39	14	39	14	33	8
	%	64	7	46	7	6	0
	# EXC.	25	1	7	0	1	0
	MD-070 N	39	14	39	14	33	8
	%	64	7	18	0	3	0
	# EXC.	25	1	8	0	0	0
	MD-165 N	40	14	40	14	34	8
	%	63	7	20	0	0	0
	# EXC.	26	1	11	2	0	0
	MD-048 N	39	14	39	14	33	8
	%	67	7	28	14	0	0

* # EXC. = Number of Excursions
N = Number of Samples
% = Percent of Excursions

TABLE 5 (continued)

		Chromium		Copper		Lead		Mercury	
	Criteria	1100 ug/l		2.9 ug/l		140 ug/l		2.1 ug/l	
	Station	Total	Since ICP	Total	Since ICP	Total	Since ICP	Total	Since ICP
Ashley River	# EXC.*	0	0	1	0	11	0	1	0
	MD-049 N	39	8	48	17	39	8	71	17
	%	0	0	2	0	28	0	1	0
	# EXC.	0	0	0	0	0	0	2	0
	MD-135 N	0	0	5	5	0	0	21	5
	%	0	0	0	0	0	0	10	0
	# EXC.	0	0	1	0	23	0	2	0
	MD-052 N	33	8	43	18	33	8	63	17
	%	0	0	2	0	70	0	3	0
	# EXC.	0	0	2	0	28	0	7	0
	MD-020 N	39	8	39	14	39	8	66	12
	%	0	0	5	0	72	0	11	0
	# EXC.	0	0	1	0	24	0	5	0
	MD-034 N	33	8	39	14	33	8	60	12
	%	0	0	3	0	73	0	8	0
Cooper River	# EXC.	1	0	2	1	4	0	1	0
	MD-044 N	30	8	36	14	30	8	58	11
	%	3	0	6	7	13	0	2	0
	# EXC.	0	0	9	1	35	0	4	0
	MD-045 N	67	8	73	14	67	8	95	12
	%	0	0	12	7	52	0	4	0
	# EXC.	0	0	7	0	54	0	5	0
	MD-046 N	69	8	74	14	69	8	99	12
	%	0	0	9	0	78	0	5	0
	# EXC.	0	0	2	0	16	0	4	0
	MD-047 N	31	8	37	14	31	8	61	11
	%	0	0	5	0	52	0	7	0
Wando River	# EXC.	0	0	6	0	39	0	1	0
	MD-115 N	55	8	61	14	55	8	71	13
	%	0	0	10	0	71	0	1	0
	# EXC.	0	0	6	0	56	0	3	0
	MD-198 N	64	7	70	13	64	7	89	10
	%	0	0	9	0	88	0	3	0
Charleston Harbor	# EXC.	0	0	7	1	25	0	5	0
	MD-071 N	33	8	39	14	33	8	64	12
	%	0	0	18	7	76	0	8	0
	# EXC.	0	0	4	0	24	0	4	0
	MD-070 N	33	8	39	14	33	8	55	10
	%	0	0	10	0	73	0	7	0
	# EXC.	0	0	3	0	24	0	6	0
	MD-165 N	34	8	40	14	34	8	57	12
	%	0	0	8	0	71	0	11	0
	# EXC.	0	0	6	1	24	0	4	0
	MD-048 N	33	8	39	14	33	8	55	12
	%	0	0	15	7	73	0	7	0

* # EXC. = Number of Excursions
N = Number of Samples
% = Percent of Excursions

With the implementation of backround corrections the incidence of excursions beyond the heavy metals criteria have decreased quite radically, both in actual numbers and in percentages. Although the capability to measure high concentrations of metals remains, the frequency of high values has declined drastically.

A T-test comparison of the individual station means for each heavy metal with the appropriate overall means for all marine district (MD) stations in the SCDHEC ambient monitoring network combined was conducted for the period of 1974 through 1987. This comparison (Table 6) showed several mean concentrations in the Harbor to be elevated relative to the other MD stations. Metals concentrations greater than 90 percent of all metal samples collected at all MD stations were common. In Table 6 only metals showing significantly elevated concentrations or values in excess of the ninetieth percentile (Appendix I) are listed. All other metals were not significantly elevated or did not have values beyond the ninetieth percentile. Lead was the metal with the greatest number of significantly elevated mean concentrations, although it was not the metal with the greatest frequency of values beyond the ninetieth percentile. Mean heavy metal concentrations greater than overall MD station means were also detected for cadmium, chromium, copper, and nickel. The number of values in excess of the ninetieth percentile for all MD stations was not a good predictor of which metals had a significantly elevated mean concentration.

A similar comparison using only Harbor and MD station data collected since the beginning of ICP analyses did not detect any instances of metals concentrations significantly greater in the Harbor than at all MD stations combined. Again using only data collected since the beginning of ICP analyses, no values for cadmium, chromium, or lead, occurred beyond the ninetieth percentile of all MD stations combined. Values in excess of the ninetieth percentile did occur for nickel, zinc, copper, and mercury (Table 7).

TABLE 6. SUMMARY OF METALS DATA COMPARISONS
CHARLESTON HARBOR AND SCDHEC MARINE
AMBIENT MONITORING STATIONS

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (ug/l)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
ASHLEY RIVER				
MD-049			Ni	2/44
			Zn	2/48
			Cd	3/30
			Cu	1/48
			Hg	3/71
MD-135	Cd p<0.0001	23.60	Cd	5/5
	Cr p<0.0001	442.00	Cr	5/5
			Hg	5/21
MD-052			Ni	4/43
			Zn	4/43
			Cd	2/33
	Pb p=0.0218	240.91	Pb	3/33
			Hg	7/63
MD-020			Ni	6/39
	Cd p=0.0348	14.51	Cd	9/39
	Cr p=0.0284	92.56	Cr	6/39
	Pb p=0.005	251.80	Pb	4/39
			Hg	10/66
MD-034			Ni	6/39
			Zn	3/39
			Cd	2/33
	Pb p=0.0078	253.03	Pb	3/33
			Hg	8/60
COOPER RIVER				
MD-044			Zn	2/36
			Cr	1/30
			Hg	3/58
MD-045			Ni	2/39
			Zn	7/73
			Cd	2/33
			Cr	1/67
	Cu p=0.0086	74.38	Cu	1/73
			Pb	3/67
			Hg	8/95

a. Pooled marine station means and ninetieth percentile values appear in Appendix 1.

b. Listing is read as: # of values/# of samples collected.

TABLE 6 (Continued)

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (ug/l)[a]	Station Parameters Exceeding Pooled 90th-%ile[a]	# of Values Exceeding Pooled 90th-%ile[b]
COOPER RIVER (continued)				
MD-046			Ni	5/40
			Zn	5/74
			Cd	4/35
			Cr	1/69
	Cu p=0.0314	72.70		0/74
	Pb p<0.0001	281.16	Pb	8/69
			Hg	14/99
MD-047			Ni	3/37
			Zn	5/37
			Cd	2/31
			Pb	1/31
			Hg	5/61
WANDO RIVER				
MD-115			Ni	8/42
			Zn	7/61
			Cd	2/36
			Cr	1/55
	Pb p=0.0168	214.91	Pb	1/55
			Hg	2/71
MD-198			Ni	6/37
			Zn	7/70
			Cd	3/31
	Cu p=0.0258	73.14	Cu	1/70
	Pb p<0.0001	276.56	Pb	5/64
			Hg	6/89
CHARLESTON HARBOR				
MD-071	Ni p=0.0002	156.92	Ni	8/39
			Zn	3/39
			Cd	3/33
			Cr	1/33
	Pb p<0.0001	299.70	Pb	4/33
			Hg	7/64
MD-070	Ni p=0.0006	153.59	Ni	11/39
			Cd	2/33
	Pb p<0.0001	301.82	Pb	6/33
			Hg	8/55

a. Pooled marine station means and ninetieth percentile values appear in Appendix 1.

b. Listing is read as: # of values/# of samples collected.

TABLE 6 (Continued)

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (ug/l)[a]	Station Parameters Exceeding Pooled 90th-%ile[a]	# of Values Exceeding Pooled 90th-%ile[b]
CHARLESTON HARBOR				
MD-165			Ni	6/40
			Zn	1/40
			Cd	2/34
	Pb p=0.0222	239.70	Pb	4/34
			Hg	11/57
MD-048			Ni	4/39
			Zn	4/39
			Cd	2/33
	Pb p=0.0306	236.36	Pb	3/33
			Hg	7/55

a. Pooled marine station means and ninetieth percentile values appear in Appendix 1.

b. Listing is read as: # of values/ # of samples collected.

TABLE 7. NUMBER OF METALS VALUES GREATER THAN 90th-%ILE FOR ALL MD STATIONS SINCE ICP

Station	Ni	Zn	Cu	Hg
ASHLEY RIVER				
MD-049		1/17*		3/17
MD-135	2/5			
MD-052	2/18	3/18		3/17
MD-020	1/14			
MD-034	1/14	1/14		
COOPER RIVER				
MD-044		2/14	1/14	
MD-045			1/14	1/14
MD-046		1/14		3/12
MD-047	2/14	3/14		1/11
WANDO RIVER				
MD-115	3/14	2/14		1/13
MD-198	2/13	1/13		1/10
CHARLESTON HARBOR				
MD-071	2/14	1/14	1/14	1/12
MD-070	2/14			1/10
MD-165	1/14			1/12
MD-048	1/14	2/14		1/12

* Listing is read as: # of values/# of samples collected.

When looking at the number and percentage of criteria excursions, significantly elevated mean concentrations, and the number of values beyond the ninetieth percentiles over the period under review one might conclude that there is a serious metals contamination problem in the Harbor and nearby waters. Looking at only the data collected since the initiation of the ICP procedure the absolute number of criteria violations and values beyond the ninetieth percentile decreases dramatically. Since ICP analyses began, none of the heavy metals exhibits concentrations significantly greater than the other MD stations. Since ICP the percentages of excursions are much lower than those observed for the entire date range examined. This appears to be largely due to the addition of corrections for backround salinity interference which results in lower total metals concentrations. This also indicates that the metals concentrations reported under Flame Atomic Absorption were artificially inflated by backround interference. Because of the relatively small number of individual measurements since the beginning of ICP analysis a single excursion beyond criteria causes a large percentage of violations.

The zinc data since the beginning of ICP analysis requires additional discussion. Although the number of excursions dropped noticeably since the initiation of ICP analysis, stations MD-052, MD-044, MD-047, MD-115, and MD-048 have shown more than one excursion beyond the criterion in less than three years. Three years in USEPA's best scientific judgement of the average amount of time it will take an unstressed system to recover from a pollution event in excess of the criterion. A stressed system would require more time for recovery. However, the USEPA (1986) states that "The resilience of ecosystems and their ability to recover differ greatly, however, and site-specific criteria may be established if adequate justification is provided."

SCDHEC monitoring data has historically indicated that zinc levels in South Carolina waters are elevated relative to USEPA criteria. This appears to be a statewide phenomena in both fresh and salt waters. These levels do

not adversely affect state fisheries, which suggests that these levels are the result of long-term local conditions to which the fauna are adapted, as opposed to point-source pollution events. The point to note is that these zinc concentrations do not seem to originate from a source that can be regulated by NPDES discharge permits, but rather may be the result of natural conditions in the state. There is not any data which suggest that these zinc concentrations are adversely affecting local fauna.

Although the data collected prior to the initiation of ICP analysis were not corrected for backround interference, all data at all MD stations were being collected and analyzed the same way, so the measured concentrations should be comparable. However, this data from some of the Harbor stations showed significantly elevated concentrations of some metals relative to all MD stations. The data collected since the initiation of ICP analysis indicate that this is no longer the case. This may be due to improved waste handling and increased awareness by local dischargers resulting from the institution and enforcement of NPDES permits by SCDHEC. The number of excursions beyond criteria are presently at acceptable levels, and none of the Harbor stations exhibit mean heavy metals concentration greater than what is seen at other MD stations.

Most of the stations considered are Class SC, which requires that no dissolved oxygen values should be less than 4.0 mg/l (SCDHEC, 1985). The two uppermost stations that were considered on the Ashley River indicated that dissolved oxygen (DO) was below the State standard for greater than ten percent of the samples collected during this time period (Table 8). MD-135 is a secondary station, so samples are only collected during the summer months when water temperatures are high, which results in lower DO concentrations. This accounts for the relatively high percentage of excursions beyond the standard. However, the absolute number of excursions is still very high relative to all of the other stations.

TABLE 8. SUMMARY OF CHARLESTON HARBOR DO, pH, BACTERIA AND TP CONCENTRATIONS EXCEEDING STATE STANDARDS OR USEPA RECOMMENDATIONS 1974-1987

Station		Diss. Oxygen <4.0 (mg/l)	pH (su)	Fecal Coli. Bact. > 2000 /100 ml	Total P > 0.1 (mg/l)
Ashley River					
MD-049	# EXC.*	13	7	4	131
	N	111	103	151	137
	%	12	7	3	96
MD-135	# EXC.	9	0	0	40
	N	68	66	73	46
	%	13	0	0	87
MD-052	# EXC.	2	5	3	63
	N	133	128	141	122
	%	2	4	2	52
MD-020	# EXC.	1	4	2	44
	N	128	123	150	122
	%	1	3	1	36
MD-034	# EXC.*	1	4	2	30
	N	124	118	143	116
	%	1	3	1	26
Cooper River					
MD-044	# EXC.	2	4	0	21
	N	119	114	139	115
	%	2	4	0	18
MD-045	# EXC.	0	3	0	32
	N	139	119	160	150
	%	0	3	0	21
MD-046	# EXC.	1	1	0	31
	N	139	120	159	150
	%	1	1	0	21
MD-047	# EXC.*	1	5	0	23
	N	122	117	140	115
	%	1	4	0	20
Charleston Harbor					
MD-071	# EXC.	12	3	1	44
	N	122	118	151	120
	%	10	3	1	37
MD-070	# EXC.	5	2	0	33
	N	122	119	141	119
	%	4	2	0	28
MD-165	# EXC.	1	3	0	23
	N	125	121	143	120
	%	1	2	0	19
MD-048	# EXC.	2	3	1	27
	N	142	136	141	114
	%	1	2	1	24

Station		Dissolved Oxygen <4.0 (mg/l)	Dissolved Oxygen < 5.0 (mg/l)	pH (su)	Fecal Coli. Bact. > 400 /100 ml	Total P > 0.1 (mg/l)
Wando River						
MD-115	# EXC.*	3	17	1	4	35
	N	122	122	97	159	139
	%	2	14	1	3	25
MD-198	# EXC.	0	12	3	1	36
	N	139	139	119	156	142
	%	0	9	3	1	25

*# EXC. = Number of Excursions
N = Number of Samples
% = Percent Excursions

Station MD-049 was one of only two stations which showed no significant trend in BOD concentration during the time period examined. Mean biochemical oxygen demand (BOD) at MD-049 was significantly greater than the mean BOD for all MD stations combined, with many values beyond the ninetieth percentile for all MD stations (Table 9). Since BOD is a measure of the oxygen required for the decomposition of carbonaceous matter in the water, it is a probable cause of the frequent DO excursions (Table 8). BOD is frequently high in wastewater treatment plant effluents, but it also may arise from a variety of nonpoint sources carried to the stream through runoff, i.e., decaying marsh grass, organic fertilizers, etc. Station MD-049 is not far from Eagle Creek, the receiving stream for the City of Summerville treatment plant. There is also a great deal of drainage from swampland and agriculture in this vicinity.

In the Ashley River the number of DO excursions below standards decreases dramatically downstream. In fact, the next two stations on the Ashley, MD-052 and MD-020, both showed significant increasing trends in dissolved oxygen concentration. All stations downstream of MD-049 showed very few BOD values above the ninetieth percentile for all MD stations combined.

The only other Class SC station showing a considerable percentage of excursions below the State DO standard was MD-071, Shem Creek at U.S. Route 17. MD-071 showed a large number of BOD values in excess of the ninetieth percentile for all MD stations, although the mean was not significantly greater than the mean for all MD stations combined. MD-071 is also near a marshy area, but the station is also very near several restaurants that feature fresh seafood offloaded daily from private fishing boats. The maintenance of these vessels and the sorting and offloading activities could conceivably contribute to DO depletion in a very limited area, but this supposition cannot be addressed by SCDHEC trend monitoring data.

The Wando River is a Class SB river. The Class SB DO standard, in addition to stating that no value shall be below 4.0 mg/l, also states that

TABLE 9. SUMMARY OF NUTRIENT AND BOD DATA COMPARISONS CHARLESTON HARBOR AND SCDHEC MARINE AMBIENT MONITORING STATIONS

Station	Station Parameter Means Greater than Pooled Mean		Station Mean (mg/l)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
ASHLEY RIVER					
MD-049	TKN	p=0.0001	1.269	TKN	22/135
				NH_3/NH_4^-	13/143
	NO_2/NO_3	p<0.0001	0.259	NO_2^-/NO_3	48/148
	TP^2	p<0.0001	0.420	TP^2	107/137
	BOD	p<0.0001	2.773	BOD	25/157
MD-135				TKN	1/26
				NH_3/NH_4^-	2/24
				NO_2^-/NO_3	6/66
	TP	p<0.0001	0.211	TP^2	7/46
				BOD	4/75
MD-052				TKN	2/121
				NH_3/NH_4^-	9/124
				NO_2^-/NO_3	4/134
				TP^2	7/122
				BOD	4/137
MD-020				TKN	3/123
				NH_3/NH_4^-	12/120
				NO_2^-/NO_3	5/137
				TP^2	3/122
				BOD	3/143
MD-034				TKN	6/116
				NH_3/NH_4^-	14/119
				NO_2^-/NO_3	1/130
				TP^2	4/116
				BOD	4/135

a. Pooled marine station means and ninetieth percentile values appear in Appendix 1.

b. Listing is read as: # of values/# of samples collected.

Table 9 (continued)

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (mg/l)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
COOPER RIVER				
MD-044			TKN	5/110
			NH_3/NH_4^-	1/117
			NO_2/NO_3	10/128
			TP	6/115
			BOD	3/137
MD-045			TKN	3/131
			NH_3/NH_4^-	9/151
			NO_2/NO_3	5/161
			TP	2/150
			BOD	2/145
MD-046			TKN	6/135
			NH_3/NH_4^-	13/146
			NO_2/NO_3	5/161
			TP	2/150
			BOD	7/146
MD-047			TKN	4/112
			NH_3/NH_4^-	10/115
			NO_2/NO_3	5/131
			BOD	3/144
WANDO RIVER				
MD-115			TKN	6/129
			NH_3/NH_4^-	15/142
			NO_2/NO_3	4/152
			TP	6/139
	BOD p=0.0002	2.657	BOD	19/150
MD-198			TKN	8/126
			NH_3/NH_4^-	16/147
			NO_2/NO_3	5/154
			TP	3/142
			BOD	5/142

a. Pooled marine station means and ninetieth percentile values appear in Appendix 1.

b. Listing is read as: # of values/# of samples collected.

Table 9 (continued)

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (mg/l)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
CHARLESTON HARBOR				
MD-071	NH_3/NH_4 p=0.037	0.270	TKN	12/116
			NH_3/NH_4^-	12/120
			NO_2^2/NO_3^4	2/135
			TP	8/120
			BOD	23/152
MD-070			TKN	2/114
			NH_3/NH_4^-	11/119
			NO_2^2/NO_3^4	6/131
			TP	5/119
			BOD	5/143
MD-165			TKN	5/120
			NH_3/NH_4^-	8/120
			NO_2^2/NO_3^4	4/132
			TP	4/120
			BOD	4/140
MD-048			TKN	6/116
			NH_3/NH_4^-	13/116
			NO_2^2/NO_3^4	3/129
			TP	1/114
			BOD	4/136

a. Pooled marine station means and ninetieth percentile values appear in Appendix 1.

b. Listing is read as: # of values/# of samples collected.

the daily average should not be less than 5.0 mg/l. Since the trend monitoring sampling consists of just a single grab sample it is not an accurate approximation of the daily average. However, to see how the trend data would compare with this standard, it was included for the Wando River stations in Table 8.

Neither MD-115 or MD-198 fared well when compared in this fashion, although they did not show a great number of values below 4.0 mg/l. Mean BOD concentration at MD-115 was significantly greater than the mean for all MD stations combined, with several values above the ninetieth percentile for the combined MD data, which is a probable cause for low DO. BOD at MD-198 showed few values in excess of the ninetieth percentile and fewer DO excursions than MD-115.

DO concentrations vary daily in a regular cycle which is attributable to the respiratory activity of phytoplankton and aquatic vegetation as well as other biological and chemical processes. Sampling several times a day to allow the calculation of a true daily average might result in a completely different picture than the examination presented here reveals. Additionally, excursions below standards are not considered to be standards violations when due to natural conditions. Whether these observed DO concentrations represent natural conditions for the Wando River would require additional investigation. It does not appear from the data gathered that flora and fauna should be adversely affected by the recorded DO levels. Similar naturally occurring DO patterns have been documented as natural DO characteristics of estuaries and tidally influenced areas.

DO concentrations at all other stations look very good relative to State standards. Not surprisingly, BOD concentrations at these stations were well in line with the values observed at other coastal stations.

The pH standard is the same for both Class SB and Class SC waters, between 6.5 and 8.5 standard units (SU). Despite the almost universal trend

of increasing pH values at the stations examined, there were very few excursions outside the standard. There are no apparent pH problems in the Charleston Harbor estuary based on the he SCDHEC trend monitoring data.

The South Carolina Class SC water quality standards for fecal coliform bacteria states that the waters shall not exceed a geometric mean of 1000/100 ml based on five consecutive samples during any 30 day period, nor shall more than 20 percent of such samples exceed 2000/100 ml during such a period. Class SB standards are similar, with the difference being that the geometric mean should not exceed 200/100 ml and no more than 10 percent of the samples shall exceed 400/100 ml for an identical sampling regimen.

Trend monitoring samples consist of a single grab sample collected once a month. Therefore, a strict interpretation of excursions beyond standards is not possible. However, these data are useful as an indication of potential bacteriological problem sites. The fecal coliform bacterial counts at each station were compared to the appropriate percentage standard; 2000 for Class SC stations and 400 for Class SB stations (Table 8) and annual geometric means were compared to the appropriate monthly geometric mean standard.

None of the overall percentages of fecal coliform bacteria excursions was anywhere close to 10%. On a year-by-year basis none of the Class SC stations exhibited greater than 10% excursions over 2000/100 ml. Using a similar approach, none of the annual geometric means for any of the Class SC stations exceeded 1000/100 ml. In fact, for Class SC stations with more than two observations per year the largest geometric mean was 302/100 ml at MD-052 in the Ashley River in 1982 and the smallest was 5/100 ml at MD-048, Fort Johnson, 1987.

On a year-by-year analysis of the Class SB stations, MD-115 did have a fecal coliform bacteria excursion frequency of 14% for 1980. This was the result of two values greater than 400 in that year, which resulted in a high percentage of excursions despite the fact that there were 14 bacteria samples

collected in 1980. These two high data values were not collected in the same 30 day period. In light of the data from earlier years and the subsequent data this does not appear t be chronic problem at this station.

At the Class SB stations in the Wando River the largest annual geometric mean occurred at MD-198 in 1975, with a value of 48/100 ml. The smallest yearly geometric mean was 6/100 ml at MD-115 in 1981. None of the annual geometric means exceed the 200/100 ml standard.

There are no official standards or criteria for nutrients in water. However, the EPA has issued recommendations for total phosphate phosphorus (TP) concentrations to limit eutrophication. These recommendations are directed at fresh water lakes and streams, but estuaries are mentioned briefly in the USEPA nutrient discussion without provision for any special recommendations. As noted earlier, elevated nutrient concentrations are undesirable because of the potential for nuisance growth of algae and other aquatic vegetation. Important considerations when examining potential impacts from nutrients are the absolute concentration, local hydrologic conditions which influence the ability of plants to take root, turbidity, and the ultimate sink for the nutrient load.

For water which does not flow into an impoundment the USEPA recommended concentration for TP to prevent accelerated eutrophication is 0.1 mg/l. The number of excursions beyond this recommendation at the Charleston Harbor stations is enormous (Table 8). The greatest percentage and frequency of excursions occurs in the upper reaches of the Ashley River. Since this is only a recommendation not necessarily applicable to estuarine waters and not a true criteria for use in evaluating water quality, it is difficult to determine the significance of these TP values when reviewed in the context of criteria.

To give these numbers some meaning, it is useful to compare them to the other coastal monitoring stations in the SCDHEC ambient monitoring network (Table 9, Appendix 1). For the comparisons provided in Table 9, any SCDHEC

data generated from studies other than trend monitoring work were eliminated prior to analysis because many of these special studies included samples of effluent from wastewater treatment facilities which would significantly bias the mean and variance of the pooled nutrient and BOD data.

Only the two upper Ashley River stations, MD-049 and MD-135, exhibited mean TP concentration significantly greater than the mean for all MD stations. At MD-049, 103 of the 137 concentrations measured were in the top 10 percent of all concentrations measured at all of the other MD stations over the same time period. There is no obvious reason for this large deviation from what is seen elsewhere along the SC coast, although phosphorus mining was conducted in the vicinity in years past. None of the other Harbor stations exhibit such large numbers of values above the ninetieth percentile.

Station MD-049 also exhibited mean total Kjeldahl nitrogen (TKN) and nitrite/nitrate concentrations greater than the mean for all other MD stations combined along with a high frequency of values greater than the ninetieth percentile. TKN is a measure of the sum of ammonia nitrogen and organic nitrogen. Nitrite/nitrate nitrogen is a measure of the end product of the aerobic decomposition of ammonia.

High NO_2 concentrations in lakes are encountered when DO levels are low. Elevated NO_3 and ammonia concentrations in lakes and ponds can result from the input of fertilizers or from plankton die-off. High nutrient concentrations can result in algae blooms which can result in DO depletion and, indirectly, fish kills. High TKN levels in the absence of high ammonia concentrations indicates the presence of high levels of organic nitrogen, either in the form of dissolved and particulate metabolic wastes or as bacterial and phyto-planktonic biomass. In the upper Ashley River, low DO was indeed in evidence, which may be indirectly related to these elevated nutrient concentrations. Further study in the upper Ashley River area is needed to identify the possible sources of these nutrients.

The only other mean nutrient concentration significantly greater than the mean for the MD stations was ammonia at MD-071. This was also the only other station with a high incidence of DO excursions. The decomposition of ammonia to nitrate requires four atoms of oxygen, as opposed to one atom of oxygen to one atom of carbon for carbonaceous waste. Therefore, an area with high ammonia concentrations would be subject to four times the DO demand of other areas, which could result in lower DO levels. No explanation for the elevated ammonia at this station is apparent, although the commercial operations along Shem Creek may be a possible reason for this condition.

The only organics detected in water at any of these stations were phenols (Appendix 2) at station MD-044 on 4/29/75. This single concentration of 2.2 ug/l is the largest ever measured at any of the MD stations. It should be noted that phenols have only been detected 12 times total at all MD stations combined with values averaging 0.52 ug/l and ranging from 0.0 ug/l to the value of 2.2 ug/l noted at MD-044.

An explanation of the organics reporting procedures is in order at this point. In the past when a scan for base-neutral or acid extractable organics was conducted, only the compounds actually detected were reported and entered into the database. Although many other chemicals were analyzed for, there is no record of this fact or that they were found to be below analytical detection limits. It is impossible to say how many samples were actually measured for phenols where the concentration was below detection limits. Therefore, the number of observations and the means for all MD stations combined are meaningless. This method of reporting has recently been changed and presently all analyses run are being reported to the database including values found to be below the detection limit for the parameter being analyzed for.

Certain pesticides, on the other hand, were specifically tested for and were therefore entered in the database even when the concentration was below detection limits. Not all stations are sampled routinely for pesticides or

organics. See Appendix 2 for further details.

Sediment

Sediment samples are collected annually at stations MD-052, MD-045, MD-115 and MD-048. Sediment samples were collected at some of the other stations on an irregular basis as part of various special studies. Due to the paucity of data, trend analysis on these data was considered to be inappropriate.

As there are no State standards or EPA criteria for sediments, the Charleston Harbor data were compared to SCDHEC sediment monitoring data from all MD stations for the same time period. The sediment data for all of the MD stations in the SCDHEC monitoring network was combined to produce a characterization of marine sediments in South Carolina (Appendix 3).

There were relatively few instances where station means were significantly greater than pooled MD station means (Table 10). Although there was no consistent pattern, chromium was the parameter with the greatest number of significantly elevated mean concentrations. Significantly greater mean Cr concentrations occurred at two stations in the Ashley River, MD-049 and MD-052, at MD-045 in the Cooper River, and at MD-198 in the Wando River.

The significance of outlying values beyond the ninetieth percentile at many of the stations must be considered with caution. At stations MD-135, MD-020, MD-034, MD-044, MD-047, and MD-165, all of the outlying values occurred in 1974 or 1975, and they represent the only sediment samples collected at these stations. There have been many improvements in analytical technique and quality control and assurance since the early 1970's. Conditions would be expected to have changed in the dozen or so years since those data were collected, and, with no comparative data derived using current procedures, little emphasis can be placed on data collected during this earlier time period.

Similarly, at the routine sediment monitoring stations (MD-052, MD-045,

TABLE 10. SUMMARY OF SEDIMENT DATA COMPARISONS
CHARLESTON HARBOR AND SCDHEC MARINE
AMBIENT MONITORING STATIONS

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (mg/kg)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
ASHLEY RIVER				
MD-049			Phosphorus	2/3
	Cr p=0.035	26.39	Cr	2/4
			Cu	2/4
			Pb	2/4
			Ni	2/3
			Zn	3/4
MD-135			Oil-Grease	1/1
			Phosphorus	1/1
			Pb	1/1
			Zn	1/1
MD-052	COD p=0.026	71833	COD	3/12
			Oil-Grease	1/12
			Org. N	2/10
			Phosphorus	3/11
			Cd	3/14
	Cr p=0.018	22.34	Cr	1/14
			Cu	6/14
			Pb	4/14
			Mn	1/3
	Zn p=0.007	70.11	Zn	7/14
			p,p'DDT	1/12
			o,p'DDT	1/12
			p,p'DDE	2/12
			Chlordane	1/3
			Hg	1/13
MD-020			Cd	1/1
MD-034			Cd	1/1

Continued on next page.

a. Pooled marine station means and ninetieth percentile values appear in Appendix 3.

b. Listing is read as: # of values/# of samples collected.

Table 10 (continued)

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (mg/kg)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
COOPER RIVER				
MD-044			COD	1/1
			Cu	1/1
			Zn	1/1
			Hg	1/1
MD-045			COD	1/11
			Oil-Grease	2/12
			Org. N	1/13
			Phosphorus	1/15
			Cd	1/16
	Cr p=0.0002	26.52	Cr	5/16
			Cu	7/16
			Pb	1/16
			Mn	1/2
			Ni	2/13
			Zn	5/15
			p,p'DDD	1/15
			p,p'DDE	2/15
			Hg	3/16
MD-046			Phosphorus	1/3
			p,p'DDD	1/4
MD-047			COD	1/1
			Oil-Grease	1/1
			Org. N	1/1
			Ni	1/1

a. Pooled marine station means and ninetieth percentile values appear in Appendix 3.

b. Listing is read as: # of values/# of samples collected.

Table 10 (continued)

Station	Station Parameter Means Greater than Pooled Mean	Station Mean (mg/kg)[a]	Station Parameters Exceeding Pooled 90th-%ILE[a]	# of Values Exceeding Pooled 90th-%ILE[b]
WANDO RIVER				
MD-115			Oil-Grease	2/11
			Org. N	1/10
			Phosphorus	2/13
			Cu	4/13
			Pb	2/13
			Zn	4/13
			PCBs	1/13
			Hg	1/13
MD-198			Phosphorus	1/3
	Cr p=0.017	30.00	Cr	1/3
			Cu	1/3
CHARLESTON HARBOR				
MD-071		NO SEDIMENT SAMPLES		
MD-070		NO SEDIMENT SAMPLES		
MD-165			Mn	1/1
			Zn	1/1
			DDT	1/1
			Dieldrin	1/1
MD-048			COD	1/12
			Oil-Grease	1/12
			Cr	1/13
			Cu	1/13
			Pb	1/13
			Zn	1/13
			p,p'DDD	1/12

a. Pooled marine station means and ninetieth percentile values appear in Appendix 3.

b. Listing is read as: # of values/# of samples collected.

MD-115, and MD-048) many of the outliers occurred in the early 1970's and are responsible for the high mean values for those parameters. Also, SCDHEC sediment samples are collected as single grab samples, with no replicates and no compositing, therefore, a great deal of variability in the measured concentrations from year to year at individual stations would be expected. At the routine sediment monitoring stations, generally the number of outlying values was small relative to the total number of samples collected.

At station MD-045 in the Cooper River, the concentration of mercury for 82/03/19 is reported as 29.00 mg/kg. This is the highest value reported at any of the MD stations. The next highest sediment mercury concentration at MD-045 was 0.4 mg/kg. Parameter distributions in sediment are very patchy, depending upon the composition of the sediments. Such variability in sediment is not unusual or surprising. In general, copper and zinc are the parameters showing the greatest frequency of high concentrations. Very few instances of elevated pesticides, PCBs or other organic contaminants were indicated.

SUMMARY

Improvements in various water quality parameters were detected between 1974 and 1987 at several of the fifteen Charleston Harbor monitoring stations considered in this report. Part of the improvement may be attributable to increased control of point source discharges through the NPDES permitting system. Changes in analytical technology, along with the institution of backround interference corrections, have resulted in increased accuracy of measurement for several parameters of interest, resulting in a more exact picture of conditions in the estuary.

In particular, concentrations of nickel, cadmium, chromium, lead, copper, zinc, and mercury in the Harbor waters appear to have been over estimated under the old analytical procedures. This resulted in apparent, almost universal, declining trends in heavy metals concentrations, which were mainly a reflection of the increased accuracy of the new analytical system and its

backround corrections. The trends that were detected are actually an artifact of the improved analytical accuracy which may have obscured or exaggerated any real environmental changes.

Comparative data from all marine stations in the SCDHEC ambient monitoring network indicate that real changes have occurred in the concentrations of these metals in the Harbor relative to the other coastal stations. In the past concentrations of these heavy metals had been higher in Charleston Harbor than other coastal areas. Concentrations of these metals are no longer elevated above levels seen at other SCDHEC monitoring stations in the marine environment. Likewise, the number of excursions beyond USEPA criteria for these heavy metals have greatly declined over the period examined, due to the increased accuracy of new analytical techniques. The routine heavy metals analyses indicate that these metals concentrations are not unusually high. Until the USEPA establishes procedures for acid soluble analytical methods for metals determination, SCDHEC will continue to employ the more conservative total metals analytical procedures.

Fecal coliform bacteria and five-day biochemical oxygen demand (BOD) showed widespread significant declines in the Harbor system. These changes may be partially due to improved controls on point source discharges. Fecal coliform bacteria appear to be meeting State standards at all stations examined. BOD was elevated at only two stations, the uppermost Ashley River station and the uppermost Wando River station. A higher rate of dissolved oxygen excursions were associated with these two stations relative to the other stations examined. Although the mean BOD was not significantly greater in Shem Creek, several occurrences of dissolved oxygen violations was also noted near the mouth of Shem Creek. Compared to State standards, dissolved oxygen was acceptable at all other stations examined.

There was an almost universal trend for increasing pH at the stations examined, with values within State standards at all stations examined.

Nutrient levels were highly variable throughout the estuary system with no clear-cut patterns. The upper Ashley River exhibited several significantly elevated nutrient parameters. Ammonia concentrations were significantly greater at Shem Creek than at the other SCDHEC marine monitoring stations.

The only organic chemical detected at any of the Harbor estuary stations was phenol in the Cooper River below the mouth of Goose Creek. This compound was only detected once, but was the highest concentration detected at any marine station during the period considered. This does not appear to be a chronic situation.

In sediments, chromium appeared as the parameter that most frequently had mean concentrations greater than other DHEC ambient marine monitoring stations. Very few pesticides or other organic compounds were detected in the sediments from the Charleston Harbor stations.

In general, the parameters which have been routinely monitored in Charleston harbor have shown great improvements since the initiation of the NPDES permitting system. Water quality is presently meeting appropriate State standards and USEPA criteria at the majority of the stations examined.

As a result of this data review several special studies are being planned for development and/or implementation during FY 1990. Two cooperative studies of the main Harbor area have been discussed with the USEPA, Athens, GA. Both studies will take advantage of new techniques developed by the USEPA. The first study, which has already been approved, is a nutrient study of the Harbor. In addition to the standard measurement of nutrient concentrations around the Harbor, this study will utilize Algal Growth Potential Test (AGPT) procedures developed for the marine environment. Standard nutrient analyses measure the total concentration of a particular nutrient in the water sample. But not all of the measured concentration is in a form that is directly biologically available. Since the objectionable aspect of elevated nutrient levels is the potential aquatic plant population

response, just what effect will the observed nutrient concentration have on aquatic plant growth? The AGPT analysis assays the amount of biologically available nutrients in a sample by measuring the growth of algae inoculated into the sample. This provides a more accurate appraisal of the impact of the observed nutrient levels than just looking at the total concentrations. The intent of this investigation will be to establish baseline AGPT data for use in evaluating current growth information and determine predictions of future trends.

The second proposed joint SCDHEC/USEPA venture for Charleston Harbor is a more thorough investigation of sediment constituents. The approach for this study will begin by examining bathymetric data for the Harbor to identify areas where sediment is settling out. These areas have the potential for showing the greatest contaminant concentrations. The USEPA has been working to develop a shipboard sampling and analysis system. If the technology is available, initial contaminant screening will be accomplished using this equipment. Subsequent samples to be analyzed for a wider range of contaminants will be collected from selected sites based upon the results of the initial screening.

Additional sampling will be conducted in the upper Ashley River, specifically to address the elevated nutrients and chronic low dissolved oxygen conditions identified in this report. Negotiations with USEPA are underway to include AGPT testing as part of this proposed study.

A special study of Shem Creek is also planned to investigate the low dissolved oxygen, and elevated biochemical oxygen demand and ammonia concentrations observed in this data review.

Although the parameters that have been sampled continuously over this period show great improvement and little cause for concern, new chemicals are becoming more widespread in use and occurrence in the environment. Concern is being expressed over the potential health impacts of organic solvents,

polycyclic aromatic hydrocarbons (PAHs), pesticides, organotins, and arsenic. While arsenic is a single element, all of the others mentioned refer to classes of contaminants, which together represent literally hundreds of specific individual compounds. For many of these compounds there are no USEPA accepted analytical procedures. For the majority of these compounds there are no USEPA criteria because there is insufficient data to fully evaluate their potential health effects.

Discussion has been undertaken with the Division of Analytical Services to determine which compounds are of the greatest concern and which ones and how many can be economically added to the ambient monitoring program. Accompanying this discussion will be a general review of current parametric coverage and sampling procedures employed in the trend monitoring program, a review which is an ongoing part of the program.

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APPENDIX 1

SUMMARY OF METALS, NUTRIENT AND BOD DATA POOLED FOR ALL SCDHEC MARINE STATIONS 1974 - 1987

ORET RETRIEVAL DATE 89/10/30

GROSS ANALYSIS

DATE FROM TO		01067 NICKEL NI.TOTAL UG/L	01092 ZINC ZN.TOT UG/L	01027 CADMIUM CD.TOT UG/L	01034 CHROMIUM CR.TOT UG/L	01042 COPPER CU.TOT UG/L	01051 LEAD PB.TOT UG/L	71900 MERCURY HG.TOTAL UG/L	00625 TOT KJEL N MG/L	00610 NH3+NH4- N TOTAL MG/L	00630 NO2&NO3 N-TOTAL MG/L
/00/00	PCTL(050.0)	60.0000	80.0000	10.0000	50.0000	50.0000	70.0000	.400000	.750000	.110000	.0899999
	PCTL(090.0)	200.000	200.000	10.0000	50.0000	100.000	460.000	1.25000	1.67000	.410000	.270000
	NUMBER	1630	1774	1448	1584	1774	1584	2965	5194	5472	7944
	MAXIMUM	920.000	3000.00	78.0000	1400.00	340.000	990.000	31.5000	22.0000	15.0000	22.0000
	MINIMUM	50.0000	1.00000	10.0000	10.0000	50.0000	50.0000	.0000000	.0000000	.0000000	.0000000
	MEAN	105.534	112.734	11.4878	59.1351	66.8771	179.413	.640026	.938271	.202625	.144438
/99/99											

ORET RETRIEVAL DATE 89/10/30

GROSS ANALYSIS

DATE FROM TO		00665 PHOS-TOT MG/L P	00310 BOD 5 DAY MG/L
/00/00	PCTL(050.0)	.0799999	1.90000
	PCTL(090.0)	.240000	4.00000
	NUMBER	6337	8526
	MAXIMUM	5.80000	39.0000
	MINIMUM	.0200000	.0500000
	MEAN	.127566	2.28388
/99/99			

APPENDIX 2

STATISTICAL SUMMARY FOR CHARLESTON HARBOR STATIONS 1974 - 1987

MD-049
32 52 50.0 080 05 20.0 3
ASHLEY RVR AT MAGNOLIA GARDENS
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030818
SANTEE COOPER MARINE
21SC60WQ HQ 03050202012 0006.540 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		168	39.31000	316.2200	17.78300	50.0	2.0	74/04/23	87/12/11
00010	WATER	TEMP	CENT	WATER		261	22.62000	45.48500	6.744300	33.0	4.0	74/04/23	87/12/11
00011	WATER	TEMP	FAHN	WATER	$	261	72.71500	147.4400	12.14300	91.4	39.2	74/04/23	87/12/11
00020	AIR	TEMP	CENT	WATER		102	22.87300	59.87000	7.737600	40.5	6.0	80/05/07	87/12/11
00041	WEATHER	WMO CODE	4501	WATER		105	2.190500	28.92500	5.378200	22	0	80/03/31	87/12/11
00067	TIDE	STAGE	CODE	WATER		23	3191.300	986300.0	993.1200	4300	2000	81/09/11	86/08/19
00076	TURB	TRBIDMTR	HACH FTU	WATER		154	20.28700	167.0100	12.92300	65.0	.2	74/05/29	87/12/11
					J	1	2.600000			2.6	2.6	81/09/02	81/09/02
					TOT	155	20.17300	167.9500	12.95900	65.0	.2	74/05/29	87/12/11
00078	TRANSP	SECCHI	METERS	WATER		7	.3428600	.0128570	.1133900	.50	.20	81/09/11	84/07/11
00080	COLOR	PT-CO	UNITS	WATER		15	72.66700	849.5300	29.14700	120	20	74/05/29	76/05/06
00300	DO		MG/L	WATER		260	5.410500	5.308100	2.303900	15.6	2.5	74/04/23	87/12/11
00301	DO	SATUR	PERCENT	WATER	$	260	59.69300	299.8600	17.31600	147.2	32.1	74/04/23	87/12/11
00306	BOD	4 DAY	MG/L	WATER		1	4.350000			4.4	4.4	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		156	2.776900	1.415900	1.189900	7.2	1.0	74/04/23	87/12/11
					J	1	2.200000			2.2	2.2	81/09/02	81/09/02
					TOT	157	2.773200	1.409000	1.187000	7.2	1.0	74/04/23	87/12/11
00322	BOD	10 DAY	MG/L	WATER		1	1.200000			1.2	1.2	78/11/24	78/11/24
00335	COD	LOWLEVEL	MG/L	WATER		27	53.60400	3059.900	55.31600	300.0	6.0	80/01/03	87/10/15
					J	1	73.00000			73.0	73.0	81/07/01	81/07/01
					TOT	28	54.29700	2960.000	54.40600	300.0	6.0	80/01/03	87/10/15
00339	COD MUD	DRY WGT	MG/KG	WATER		2	4915.000	448.0000	21.16600	4930	4900	75/07/01	75/07/03
00340	COD	HI LEVEL	MG/L	WATER		18	134.6100	18816.00	137.1700	600	44	74/11/25	85/07/11
					K	1	50.00000			50	50	76/12/09	76/12/09
					TOT	19	130.1600	18147.00	134.7100	600	44	74/11/25	85/07/11
00400	PH		SU	WATER		150	7.109900	.2197200	.4687400	8.50	4.80	74/04/23	87/12/11
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		214	8748.600	56813000	7537.400	32000	50	78/04/03	87/12/11
00403	PH	LAB	SU	WATER		161	7.116400	.1855000	.4307000	8.2	4.9	74/04/23	87/12/11
00410	T ALK	CACO3	MG/L	WATER		160	61.04600	878.0800	29.63200	140	8	74/04/23	87/12/11
00480	SALINITY		PPTH	WATER		217	5.588000	21.11400	4.595000	18.0	.0	74/09/19	87/12/11
					K	2	1.000000	.0000000	.0000000	1.0	1.0	87/01/23	87/02/23
					TOT	219	5.546100	21.11100	4.594700	18.0	.0	74/09/19	87/12/11
00530	RESIDUE	TOT NFLT	MG/L	WATER		10	26.00000	96.22200	9.809300	42	13	81/02/06	84/07/11
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		2	62.15000	.0429690	.2072900	62.300	62.000	75/07/01	75/07/03
00610	NH3+NH4-	N TOTAL	MG/L	WATER		122	.2415500	.1576800	.3970800	4.000	.050	75/12/05	87/12/11
					K	21	.0504760	.0003847	.0196160	.100	.020	74/11/25	86/08/19
					TOT	143	.2134900	.1390200	.3728500	4.000	.020	74/11/25	87/12/11
00612	UN-IONZD	NH3-N	MG/L	WATER	$	122	.0032308	.0004747	.0217890	.241	.00004	76/03/25	87/12/11
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	122	.0039283	.0007018	.0264930	.293	.00005	76/03/25	87/12/11

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	PARAMETER		MEDIUM		RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00625	TOT KJEL	N	MG/L	WATER		132	1.295500	.9440700	.9716300	7.800	.140	75/01/27	87/12/11
					K	3	.1066700	.0001333	.0115470	.120	.100	74/11/25	80/07/23
					TOT	135	1.269100	.9538700	.9766600	7.800	.100	74/11/25	87/12/11
00626	ORGAN. N MUD D WT		MG/KG-N	WATER		4	164.0800	16374.00	127.9600	325.00	11.80	75/07/01	84/07/10
					K	1	2.500000			2.50	2.50	81/09/11	81/09/11
					TOT	5	131.7600	17502.00	132.3000	325.00	2.50	75/07/01	84/07/10
00630	NO2&NO3	N-TOTAL	MG/L	WATER		145	.2643400	.0856870	.2927200	3.24	.04	74/05/29	87/12/11
					K	3	.0200000	.0000000	.0000000	.02	.02	81/02/06	82/06/25
					TOT	148	.2593900	.0851320	.2917700	3.24	.02	74/05/29	87/12/11
00660	ORTHLPO4	PO4	MG/L	WATER		9	.5066700	.1019000	.3192200	1.14	.18	74/05/29	75/04/08
00 65	PHOS-TOT		MG/L P	WATER		135	.4240700	.0460650	.2146300	1.400	.070	75/06/05	87/12/11
					K	2	.1750000	.0312500	.1767800	.300	.050	74/11/25	75/01/27
					TOT	137	.4204300	.0465170	.2156800	1.400	.050	74/11/25	87/12/11
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		3	3685.300	40129000	6334.700	11000.0	8.5	81/09/11	84/07/10
00671	PHOS-DIS	ORTHO	MG/L P	WATER		3	.3066700	.0010333	.0321450	.330	.270	84/07/10	84/07/11
00680	T ORG C	C	MG/L	WATER		63	15.27900	41.52300	6.443800	37.4	3.4	74/11/25	87/10/15
00900	TOT HARD	CACO3	MG/L	WATER		5	993.0000	1176500	1084.700	2700	75	78/03/22	87/05/04
00916	CALCIUM	CA-TOT	MG/L	WATER		3	100.6700	7921.400	89.00200	190.0	12.0	85/01/11	86/05/16
00925	MGNSIUM	MG,DISS	MG/L	WATER		11	85.28200	14200.00	119.1600	330.0	2.8	75/03/12	76/05/06
00927	MGNSIUM	MG,TOT	MG/L	WATER		3	280.3300	72630.00	269.5000	550.0	11.0	85/01/11	86/05/16
00940	CHLORIDE	TOTAL	MG/L	WATER		70	2710.900	9260300	3043.100	13000	14	74/09/19	87/12/11
					K	1	50.00000			50	50	79/11/06	79/11/06
					TOT	71	2673.400	9227800	3037.700	13000	14	74/09/19	87/12/11
01000	ARSENIC	AS,DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/25	74/11/25
01025	CADMIUM	CD,DISS	UG/L	WATER		3	17.33300	121.3300	11.01500	30	10	75/01/27	77/10/06
					K	17	11.17700	23.53000	4.850700	30	10	74/05/29	77/05/03
					TOT	20	12.10000	37.67400	6.137900	30	10	74/05/29	77/10/06
01027	CADMIUM	CD,TOT	UG/L	WATER		4	20.50000	121.0000	11.00000	30	10	77/07/08	81/01/30
					K	35	10.00000	.0000000	.0000000	10	10	76/04/03	87/10/15
					TOT	39	11.07700	19.96800	4.468500	30	10	77/07/08	87/10/15
01028	CD MLD	DRY WGT	MG/KG-CD	WATER	K	4	.9075000	.0342250	.1850000	1.00	.63	75/07/01	84/07/10
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		4	26.36800	254.9000	15.96600	40.00	9.47	75/07/01	84/07/10
01030	CHROMIUM	CR,DISS	UG/L	WATER		2	100.0000	200.0000	14.14200	110	90	76/03/25	76/07/13
					K	18	50.00000	.0000000	.0000000	50	50	74/05/29	77/10/06
					TOT	20	55.00000	247.3700	15.72800	110	50	74/05/29	77/10/06
01034	CHROMIUM	CR,TOT	UG/L	WATER	K	39	50.00000	.0000000	.0000000	50	50	77/07/08	87/10/15
01040	COPPER	CU,DISS	UG/L	WATER		2	550.0000	405000.0	636.4030	1000	100	74/11/25	75/04/08
					K	23	100.0000	.0000000	.0000000	100	100	74/05/29	77/10/06
					TOT	25	136.0000	32400.00	180.0000	1000	100	74/05/29	77/10/06

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01042	COPPER	CU,TOT	UG/L	WATER		1	330.0000			330	330	81/07/01	81/07/01
					K	47	62.76600	485.6700	22.03800	100	50	77/07/08	87/10/15
					TOT	48	68.33300	1963.100	44.30700	330	50	77/07/08	87/10/15
01043	COPPLR	SEDMG/KG	DRY WGT	WATER		3	32.66700	506.3400	22.50200	49.00	7.00	81/09/11	84/07/10
					K	1	6.300000			6.30	6.30	75/07/01	75/07/01
					TOT	4	26.07500	511.3600	22.61300	49.00	6.30	75/07/01	84/07/10
01045	IRON	FE,TOT	UG/L	WATER		48	1399.000	1787500	1337.000	9000	320	77/07/08	87/10/15
01046	IRON	FE,DISS	UG/L	WATER		25	1013.800	522800.0	723.0500	3500	220	74/05/29	77/10/06
01049	LEAD	PB,DISS	UG/L	WATER		10	121.3000	4954.700	70.39000	280	50	74/07/24	77/10/06
					K	15	50.00000	.0000000	.0000000	50	50	74/05/29	77/04/05
					TOT	25	78.52000	3128.900	55.93700	280	50	74/05/29	77/10/06
01051	LEAD	PB,TOT	UG/L	WATER		18	186.1100	8107.500	90.04200	430	50	78/01/10	84/01/06
					K	21	50.00000	.0000000	.0000000	50	50	77/07/08	87/10/15
					TOT	39	112.8200	8352.400	91.39100	430	50	77/07/08	87/10/15
01052	LEAD	SEDMG/KG	DRY WGT	WATER		4	30.82500	372.7200	19.30600	49.00	13.30	75/07/01	84/07/10
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	23.40000			23.40	23.40	75/07/01	75/07/01
01055	MANGNESE	MN	UG/L	WATER		32	115.6300	7302.800	85.45700	440.0	50.0	77/07/08	87/07/08
					K	9	50.00000	.0000000	.0000000	50.0	50.0	80/01/03	87/10/15
					TOT	41	101.2200	6416.000	80.10000	440.0	50.0	77/07/08	87/10/15
01056	MANGNESE	MN,DISS	UG/L	WATER		13	86.92300	1056.400	32.50300	170.0	50.0	75/04/08	77/10/06
					K	5	50.00000	.0000000	.0000000	50.0	50.0	75/03/12	76/12/09
					TOT	18	76.66700	1035.300	32.17600	170.0	50.0	75/03/12	77/10/06
01065	NICKEL	NI,DISS	UG/L	WATER		3	103.3300	33.34800	5.774800	110	100	75/12/05	77/10/06
					K	15	100.0000	.0000000	.0000000	100	100	75/03/12	77/08/25
					TOT	18	100.5600	5.558800	2.357700	110	100	75/03/12	77/10/06
01067	NICKEL	NI,TOTAL	UG/L	WATER		14	130.7200	2945.600	54.27400	250	50	77/07/08	85/07/11
					K	30	61.66700	462.6500	21.50900	100	50	78/01/10	87/10/15
					TOT	44	83.63600	2260.900	47.54900	250	50	77/07/08	87/10/15
01068	NICKEL	SEDMG/KG	DRY WGT	WATER		2	21.50000	4.500000	2.121300	23.00	20.00	82/06/25	84/07/10
					K	1	6.300000			6.30	6.30	75/07/01	75/07/01
					TOT	3	16.43300	79.26400	8.903000	23.00	6.30	75/07/01	84/07/10
01090	ZINC	ZN,DISS	UG/L	WATER		4	130.0000	600.0000	24.49500	150	100	75/04/08	77/08/25
					K	15	100.0000	.0000000	.0000000	100	100	74/11/25	77/10/06
					TOT	19	106.3200	257.9000	16.05900	150	100	74/11/25	77/10/06
01092	ZINC	ZN,TOT	UG/L	WATER		33	117.2700	3801.700	61.65800	270	50	77/07/08	87/07/08
					K	15	60.00000	428.5700	20.70200	100	50	78/01/10	87/10/15
					TOT	48	99.37500	3435.800	58.61600	270	50	77/07/08	87/10/15
01093	ZINC	SEDMG/KG	DRY WGT	WATER		4	114.2800	6419.100	80.11900	180.00	17.10	75/07/01	84/07/10
01170	FE MUD	DRY WGT	MG/KG-FE	WATER		1	40000.00			40000.00	40000.00	82/06/25	82/ 6/25

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31501	TOT COLI MFIMENDD		/100ML	WATER		2	4400.000	14580000	3818.400	7100	1700	82/06/25	82/06/25
31505	TOT COLI MPN CONF		/100ML	WATER		2	635.0000	162450.0	403.0500	920	350	86/05/16	86/08/19
					L	1	2400.000			2400	2400	86/08/19	86/08/19
					TOT	3	1223.300	1119600	1058.100	2400	350	86/05/16	86/08/19
31506	TOT COLI MPN CONF		TUBECODE	WATER		5	828.0000	267470.0	517.1800	1600	350	81/09/11	84/07/11
					L	1	2400.000			2400	2400	81/09/11	81/09/11
					TOT	6	1090.000	625840.0	791.1000	2400	350	81/09/11	84/07/11
31615	FEC COLI MPNECMED		/100ML	WATER		12	259.1700	186970.0	432.4000	1600	49	79/04/06	86/08/19
31616	FEC COLI MFM-FCBR		/100ML	WATER		93	263.0300	157900.0	397.3700	2800	24	74/04/23	87/10/15
					J	52	334.0000	221400.0	470.5300	2030	8	76/09/13	87/12/11
					L	6	780.0000	660960.0	813.0000	2400	240	77/03/15	87/08/12
					TOT	151	308.0100	204550.0	452.2800	2800	8	74/04/23	87/12/11
34257	BETA BHC	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	82/06/25	82/06/25
39076	ALPHABHC	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	82/06/25	82/06/25
39300	P,P'DDT		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39301	P,P'DDT	SEDUG/KG	DRY WGT	WATER		1	.6300000			.63	.63	75/07/01	75/07/01
					K	2	2.000000	.0000000	.0000000	2.00	2.00	82/06/25	84/07/10
					TOT	3	1.543300	.6256400	.7909700	2.00	.63	75/07/01	84/07/10
39305	O,P' DDT	WHL SMPL	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39306	O,P' DDT	MUD DRY	UG/KG	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39310	P,P'DDD		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39315	O,P' DDD	WHL SMPL	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39320	P,P'DDE		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39327	O P DDE	WHL SMP L	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39328	O,P'EDE	MUD	UG/KG	WATER	K	1	2.000000			2.00	2.00	82/06/25	82/06/25
39330	ALDRIN		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39337	ALPHABHC		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39338	BETA BHC		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39343	GAMC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/07/01	75/07/01
39351	CLANEDRY	TECHMET	MUDUG/KG	WATER	K	1	2.000000			2.00	2.00	82/06/25	82/06/25
39380	DIELDRIN		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39390	ENDRIN		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39398	ETHION	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10

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39399	ETHION	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/07/01	84/07/10
39400	TOXAPHEN		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39410	HEPTCHLR		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39420	HPCHLREP		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39516	PCES	WHL SMPL	UG/L	WATER	K	5	.5000000	.0000000	.0000000	.500	.500	81/09/11	84/07/10
39519	PCES	MUD	UG/KG	WATER	K	2	10.00000	.0000000	.0000000	10.00	10.00	82/06/25	84/07/10
39530	MALATHN	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10
39531	MALATHN	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/07/01	84/07/10
39540	PARATHN	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10
39541	PARATHN	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/07/01	84/07/10
39570	DIAZINON	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10
39571	DIAZINON	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/07/01	84/07/10
39580	GUTHION	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10
39581	GUTHION	MUD DRY	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/07/01	84/07/10
39 10	PHOSDRIN	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10
39782	LINDANE	WHL SMPL	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	81/09/11	84/07/10
39783	LINDANE	MUD DRY	UG/KG	WATER	K	3	1.366700	1.203300	1.097000	2.00	.10	75/07/01	84/07/10
39786	TRITHION	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	81/09/11	84/07/10
39787	TRITHION	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/07/01	84/07/10
46570	CAL HARD	CA MG	MG/L	WATER	$	3	1405.800	1774300	1332.000	2739	75	85/01/11	86/05/16
70320	MOISTURE	CONTENT	PERCENT	WATER		2	16.90000	.0000000	.0000000	17	17	75/07/01	75/07/03
70322	RESIDUE	TOT VOL	PERCENT	WATER		2	1.610000	.0001993	.0141180	1.8	1.6	75/07/01	75/07/03
70507	PHOS-T	ORTHO	MG/L P	WATER		11	.1863600	.0149260	.1221700	.470	.060	75/07/29	82/06/25
					K	1	.0200000			.020	.020	75/06/05	75/06/05
					TOT	12	.1725000	.0158750	.1260000	.470	.020	75/06/05	82/06/25
71900	MERCURY	HG,TOTAL	UG/L	WATER		40	.5715000	.5745000	.7579610	4.7	.2	74/05/29	86/04/04
					K	31	.2774200	.0178070	.1334400	.5	.2	75/06/05	87/10/15
					TOT	71	.4431000	.3492900	.5910000	4.7	.2	74/05/29	87/10/15
71921	MERCURY	SEDMG/KG	DRY WGT	WATER	K	4	.3000000	.0183330	.1354000	.5	.2	75/07/01	84/07/10
74041	NOF	SAMPLE	UPDATED	WATER		49	866320.0	33904000	5822.700	880418	860529	84/07/10	87/12/11
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.2800000			.28	.28	75/07/01	75/07/01
82048	BOT DPTH	OF SMPL	METERS	WATER		223	2.549700	10.34300	3.216100	14.00	.30	74/04/23	87/12/11

/TYPE/AMENT/ESTUARY

MD-135 ASHLEY RIVER
32 50 10.0 079 59 10.0 3
ASHLEY RVR ON SCT (N BRDG)
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST
SANTEE COOPER
21SC60WQ HQ 03050202010 0005.830 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RNK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	MSAMPLOC	% FROM	RT BANK	WATER		83	49.27700	21.42400	4.628600	50.0	20.0	74/04/23	87/10/26
00010	WATER	TEMP	CENT	WATER		212	25.90200	16.66900	4.082800	31.0	7.0	74/04/23	87/10/26
00011	WATER	TEMP	FAHN	WATER	$	212	78.62300	54.12300	7.356900	87.8	44.6	74/04/23	87/10/26
00020	AIR	TEMP	CENT	WATER		42	27.72600	15.88100	3.985100	33.0	17.0	80/05/29	87/10/26
00041	WEATHER	WMO CODE	4501	WATER		42	.9047600	.7712000	.8781800	2	0	80/05/29	87/10/26
00067	TIDE	STAGE	CODE	WATER		29	3069.000	1040100	1019.800	4300	2000	84/05/18	87/10/26
00076	TURB	TRBIDMTR	HACH FTU	WATER		73	11.39700	66.40400	8.148900	50.0	2.0	74/05/29	87/10/26
00080	COLOR	PT-CO	UNITS	WATER		14	39.64300	69.32500	7.957700	60	30	74/05/29	76/03/25
00300	DO		MG/L	WATER		212	5.472700	2.059100	1.435000	11.8	2.8	74/04/23	87/10/26
00301	DO	SATUR	PERCENT	WATER	$	212	65.85300	228.7900	15.12600	128.3	35.3	74/04/23	87/10/26
00306	BOD	4 DAY	MG/L	WATER		1	2.900000			2.9	2.9	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		75	2.378000	1.244700	1.115600	8.8	1.1	74/04/23	87/10/26
00312	BOD	6 DAY	MG/L	WATER		1	2.500000			2.5	2.5	84/07/25	84/07/25
00339	COD MUD	DRY WGT	MG/KG	WATER		1	50000.00			50000	50000	75/10/20	75/10/20
00340	COD	HI LEVEL	MG/L	WATER		7	200.4300	8428.000	91.80400	300	88	74/11/25	76/03/25
00400	PH		SU	WATER		78	7.458900	.1437200	.3791000	8.50	6.60	74/04/23	87/10/26
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		179	29877.00	44683000	6684.500	39500	8500	77/04/28	87/10/26
00403	PH	LAB	SU	WATER		40	7.233000	.3419000	.5847300	8.1	5.3	74/04/23	85/06/26
00410	T ALK	CACO3	MG/L	WATER		38	81.33700	401.6000	20.04000	130	46	74/04/23	85/06/26
00480	SALINITY		PPTH	WATER		184	18.25800	19.80000	4.449700	27.0	1.5	74/09/19	87/10/26
00530	RESIDUE	TOT NFLT	MG/L	WATER		4	22.50000	25.00000	5.000000	28	16	85/06/25	85/06/26
00557	OIL-GRSE	MUD ERGR	MG/KG	WATER		1	4000.000			4000.000	4000.000	75/10/20	75/10/20
00610	NH3+NH4-	N TOTAL	MG/L	WATER		20	.2155000	.0735840	.2712600	1.200	.030	75/04/08	86/08/19
					K	4	.0360000	.0003000	.0173210	.050	.020	74/11/25	83/08/26
					TOT	24	.1854200	.0655470	.2560200	1.200	.020	74/11/25	86/08/19
00612	UN-IONZD	NH3-N	MG/L	WATER	$	17	.0040330	.0000255	.0050594	.021	.0003	76/03/25	86/08/19
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	17	.0049036	.0000378	.0061517	.026	.0003	76/03/25	86/08/19
00625	TOT KJEL	N	MG/L	WATER		25	.7348000	.3456900	.5879500	3.200	.120	75/01/27	86/08/19
					K	1	.1200000			.120	.120	74/11/25	74/11/25
					TOT	26	.7111500	.3464000	.5885500	3.200	.120	74/11/25	86/08/19
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		1	1050.000			1050.00	1050.00	75/10/20	75/10/20
00630	NO2&NO3	N-TOTAL	MG/L	WATER		66	.1645500	.0085726	.0925890	.54	.03	74/05/29	87/10/26
00660	ORTHOPO4	PO4	MG/L	WATER		9	.4722200	.0498200	.2232000	.81	.18	74/05/29	75/04/08
00665	PHOS-TOT		MG/L P	WATER		44	.2122700	.0137900	.1174300	.760	.060	75/07/29	87/10/26
					K	2	.1750000	.0312500	.1767800	.300	.050	74/11/25	75/01/27
					TOT	46	.2106500	.0139310	.1180300	.760	.050	74/11/25	87/10/26
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		1	3880.000			3880.0	3880.0	75/10/20	75/10/20
00680	T ORG C	C	MG/L	WATER		8	10.01500	10.42500	3.228700	14.9	6.0	74/11/25	77/06/08
00925	MGNSIUM	MG,DISS	MG/L	WATER		9	343.1100	13244.00	115.0800	488.0	149.0	75/03/12	76/03/25

/TYPA/AMBNT/ESTURY

MD-135 ASHLEY RIVER
32 50 10.0 079 59 10.0 3
ASHLEY RVR ON SCT (N BRDG)
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST
SANTEE COOPER
21SC60WQ HQ 03050202010 0005.830 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00927	MGNSIUM	MG.TOT	MG/L	WATER		4	590.0000	3266.700	57.15500	670.0	540.0	85/06/25	85/06/26
01000	ARSENIC	AS.DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/25	74/11/25
01002	ARSENIC	AS.TOT	UG/L	WATER	K	4	5.000000	.0000000	.0000000	5	5	85/06/25	85/06/26
01025	CADMIUM	CD.DISS	UG/L	WATER		1	12.00000			12	12	75/01/27	75/01/27
					K	11	11.81800	36.36400	6.030200	30	10	74/05/29	76/06/17
					TOT	12	11.83300	33.06100	5.749800	30	10	74/05/29	76/06/17
01027	CADMIUM	CD.TOT	UG/L	WATER		5	23.60000	7.300600	2.702000	28	21	85/06/25	85/07/10
01028	CD MUD	DRY WGT	MG/KG-CD	WATER	K	1	.7200000			.72	.72	75/10/20	75/10/20
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		1	13.70000			13.70	13.70	75/10/20	75/10/20
01030	CHROMIUM	CR.DISS	UG/L	WATER		1	50.00000			50	50	76/03/25	76/03/25
					K	11	50.00000	.0000000	.0000000	50	50	74/05/29	76/06/17
					TOT	12	50.00000	.0000000	.0000000	50	50	74/05/29	76/06/17
01034	CHROMIUM	CR.TOT	UG/L	WATER		5	442.0000	520.0000	22.80400	470	420	85/06/25	85/07/10
01040	COPPER	CU.DISS	UG/L	WATER		2	1085.000	1674500	1294.000	2000	170	74/11/25	75/04/08
					K	15	100.0000	.0000000	.0000000	100	100	74/05/29	76/06/17
					TOT	17	215.8800	211660.0	460.0700	2000	100	74/05/29	76/06/17
01042	COPPER	CU.TOT	UG/L	WATER	K	5	50.00000	.0000000	.0000000	50	50	85/06/25	85/07/10
01043	COPPER	SEDMG/KG	DRY WGT	WATER	K	1	7.200000			7.20	7.20	75/10/20	75/10/20
01045	IRON	FE.TOT	UG/L	WATER		5	550.0000	10000.00	100.0000	700	450	85/06/25	85/07/10
01046	IRON	FE.DISS	UG/L	WATER		17	787.7100	194300.0	440.8000	2000	290	74/05/29	76/06/17
01049	LEAD	PB.DISS	UG/L	WATER		11	155.4600	5307.300	72.85100	290	70	74/07/24	76/06/17
					K	6	50.00000	.0000000	.0000000	50	50	74/05/29	76/02/26
					TOT	17	118.2400	6015.500	77.55900	290	50	74/05/29	76/06/17
01051	LEAD	PB.TOT	UG/L	WATER		5	142.0000	1420.000	37.68300	200	100	85/06/25	85/07/10
01052	LEAD	SEDMG/KG	DRY WGT	WATER		1	180.0000			180.00	180.00	75/10/20	75/10/20
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	108.0000			108.00	108.00	75/10/20	75/10/20
01055	MANGNESE	MN	UG/L	WATER		5	68.00000	70.00000	8.366600	80.0	60.0	85/06/25	85/07/10
01056	MANGNESE	MN.DISS	UG/L	WATER		6	81.66700	656.6700	25.62600	120.0	50.0	75/04/08	76/06/17
					K	4	50.00000	.0000000	.0000000	50.0	50.0	75/03/12	76/03/25
					TOT	10	69.00000	632.2200	25.14400	120.0	50.0	75/03/12	76/06/17
01065	NICKEL	NI.DISS	UG/L	WATER		3	110.0000	100.0000	10.00000	120	100	75/12/05	76/02/12
					K	7	100.0000	.0000000	.0000000	100	100	75/03/12	76/06/17
					TOT	10	103.0000	45.55600	6.749500	120	100	75/03/12	76/06/17
01067	NICKEL	NI.TOTAL	UG/L	WATER		4	57.50000	91.66700	9.574300	70	50	85/06/25	85/07/10
					K	1	50.00000			50	50	85/06/25	85/06/25
					TOT	5	56.00000	80.00000	8.944300	70	50	85/06/25	85/07/10
01068	NICKEL	SEDMG/KG	DRY WGT	WATER	K	1	7.200000			7.20	7.20	75/10/20	75/10/20
01090	ZINC	ZN.DISS	UG/L	WATER		1	180.0000			180	180	75/04/08	75/04/08
					K	10	100.0000	.0000000	.0000000	100	100	74/11/25	76/06/17

/TYPA/AMBNT/ESTURY

MD-135 ASHLEY RIVER
32 50 10.0 079 59 10.0 3
ASHLEY RVR ON SCT (N BRDG)
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST
SANTEE COOPER
21SC60WQ HQ 03050202010 0005.830 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01090	ZINC	ZN,DISS	UG/L	WATER	TOT	11	107.2700	581.8300	24.12100	180	100	74/11/25	76/06/17
01092	ZINC	ZN,TOT	UG/L	WATER	K	5	50.00000	.0000000	.0000000	50	50	85/06/25	85/07/10
01093	ZINC	SEDMG/KG	DRY WGT	WATER		1	150.0000			150.00	150.00	75/10/20	75/10/20
31505	TOT COLI	MPN CONF	/100ML	WATER		6	124.0000	10650.00	103.2000	240	17	85/06/25	85/06/26
					L	3	2400.000	.0000000	.0000000	2400	2400	86/08/19	86/10/27
					TOT	8	977.5000	1393600	1180.500	2400	17	85/06/25	86/10/27
31615	FEC COLI	MPNECMED	/100ML	WATER		7	105.0000	36950.00	192.2200	540	17	85/06/25	86/10/27
					L	1	2400.000			2400	2400	86/08/19	86/08/19
					TOT	8	391.8800	690050.0	830.6930	2400	17	85/06/25	86/10/27
31616	FEC COLI	MFM-FCBK	/100ML	WATER		51	107.3300	10012.00	100.0600	500	8	74/04/23	87/10/26
					J	17	114.3500	34247.00	185.0600	780	8	76/10/19	87/09/29
					K	1	1.000000			1	1	85/08/16	85/08/16
					L	4	560.0000	54400.00	233.2400	800	240	74/08/21	83/07/05
					TOT	73	132.3200	27749.00	166.5800	800	1	74/04/23	87/10/26
39301	P,P'DDT	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39306	O,P' DDT	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39343	GBHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39399	ETHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/10/20	75/10/20
39403	TOXAPHLN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39531	MALATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/10/20	75/10/20
39541	PARATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/10/20	75/10/20
39571	DIAZINON	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/10/20	75/10/20
39581	GUTHION	MUD DRY	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/10/20	75/10/20
39783	LINDANE	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/10/20	75/10/20
39787	TRITHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/10/20	75/10/20
70220	MOISTURE	CONTENT	PERCENT	WATER		1	55.00000			55	55	75/10/20	75/10/20
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	4.900000			4.9	4.9	75/10/20	75/10/20
70507	PHOS-T	ORTHO	MG/L P	WATER		22	.1454600	.0049118	.0700840	.320	.040	75/07/29	85/06/26
71900	MERCURY	HG,TOTAL	UG/L	WATER		14	1.405000	2.936300	1.713600	5.3	.2	74/05/29	85/06/26
					K	7	.4142900	.0214290	.1463900	.5	.2	75/07/29	85/07/10
					TOT	21	1.074800	2.144100	1.464300	5.3	.2	74/05/29	85/07/10

/TYPA/AMBNT/ESTURY

MD-135 ASHLEY RIVER
32 50 10.0 079 59 10.0 3
ASHLEY RVR DN SCT (N BRDG)
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST
SANTEE COOPER
21SC60WQ HQ 03050202010 0005.830 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		1	.3000000			.3	.3	75/10/20	75/10/20
74041	WOF	SAMPLE	UPDATED	WATER		48	865340.0	29985000	5475.800	880211	860721	86/05/30	87/10/26
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	7.030000			7.03	7.03	75/10/20	75/10/20
82048	BOT EPTH	OF SMPL	METERS	WATER		204	3.273500	9.385400	3.063600	12.00	.30	74/04/23	87/10/26

MD-052
32 48 00.0 079 58 40.0 3
ASHLEY RVR AT S ATLANTIC LINE RR
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030818
SANTEE COOPER MARINE
21SC00WQ HQ 03050202011 0006.820 OFF
0000 FEET DEPTH

/TYPE/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		266	49.88700	3.384900	1.839800	50.0	20.0	74/03/07	87/12/21
00010	WATER	TEMP	CENT	WATER		771	20.06200	53.32900	7.302700	34.0	2.5	74/04/23	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	771	68.10900	172.6700	13.14000	93.2	36.5	74/04/23	87/12/21
00020	AIR	TEMP	CENT	WATER		191	20.15500	56.70700	7.530400	55.0	6.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		4	21.00000	12.66700	3.559000	25.0	18.0	81/03/31	82/03/05
00030	INCDT LT	SURF	C/SQCM/D	WATER		1	8.200000			8	8	83/03/25	83/03/25
00041	WEATHER	WMO CODE	4501	WATER		198	.6919200	.8030800	.8961500	2	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		58	2701.700	822610.0	906.9800	4200	2000	81/03/31	87/12/21
00075	TURB	HLGE	PPM SIO2	WATER		1	60.00000			60.0	60.0	74/03/07	74/03/07
00076	TURB	TRBIDMTR	PACH FTU	WATER		137	9.340800	135.0700	11.62200	130.0	1.1	74/05/29	87/12/21
00080	COLOR	PT-CO	UNITS	WATER		14	33.20700	129.6200	11.38500	60	10	74/03/07	78/04/24
					K	1	5.000000			5	5	81/11/19	81/11/19
					TOT	15	31.32700	173.4000	13.16800	60	5	74/03/07	81/11/19
00300	DO		MG/L	WATER		771	7.131300	5.127700	2.264500	14.5	3.3	74/04/23	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	770	74.75300	220.2100	14.84000	118.9	33.7	74/04/23	87/12/21
00306	BOD	4 DAY	MG/L	WATER		1	3.800000			3.8	3.8	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		136	1.859800	.6111100	.7817400	5.0	.3	74/04/23	87/12/21
					L	1	6.550000			6.6	6.6	76/07/27	76/07/27
					TOT	137	1.894000	.7671900	.8758900	6.6	.3	74/04/23	87/12/21
00312	BOD	6 DAY	MG/L	WATER		2	2.450000	.1250000	.3535530	2.7	2.2	74/03/07	84/07/25
00322	BOD	10 DAY	MG/L	WATER		1	1.200000			1.2	1.2	78/11/24	78/11/24
00339	COD MUD	DRY WGT	MG/KG	WATER		12	71833.00	1337E+06	36571.00	130000	34000	75/07/01	86/12/04
00340	COD	HI LEVEL	MG/L	WATER		7	237.5700	16549.00	128.6500	398	68	74/09/19	76/03/25
004 0	PH		SU	WATER		146	7.639600	.1692100	.4113500	8.60	5.90	74/04/23	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		737	27566.00	57953000	7612.700	42000	8500	78/04/24	87/12/21
00403	PH	LAB	SU	WATER		147	7.542400	.1229400	.3506300	8.0	5.5	74/03/07	87/12/21
00410	T ALK	CACO3	MG/L	WATER		146	80.90400	287.5100	16.95600	129	40	74/03/07	87/12/21
00480	SALINITY		PPTH	WATER		743	19.15800	19.92100	4.463300	31.0	6.8	74/09/19	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		4	14.00000	22.00000	4.690400	21	11	85/06/25	85/06/26
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		12	364.3700	198220.0	445.2100	1700.000	56.000	75/07/01	87/12/21
00610	NH3+NH4-	N TOTAL	MG/L	WATER		109	.2275200	.0323830	.1799500	1.000	.050	75/04/08	87/12/21
					K	15	.0440000	.0001542	.0124210	.050	.020	74/11/25	87/08/28
					TOT	124	.2053200	.0320620	.1790630	1.000	.020	74/11/25	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	100	.0045075	.0000212	.0046094	.028	.0003	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	100	.0054806	.0000314	.0056045	.034	.0004	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		116	.7157700	.1616400	.4020400	3.300	.080	75/01/27	87/12/21
					K	5	.0920000	.0009200	.0303320	.120	.040	74/11/25	85/02/01
					TOT	121	.6900000	.1704800	.4128900	3.300	.040	74/11/25	87/12/21
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		9	1396.000	1506500	1227.400	3400.00	3.75	75/07/01	84/01/30

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/TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00626	ORGAN. N MUD D WT		MG/KG-N	WATER	K	1	30.00000			30.00	30.00	81/01/26	81/01/26
00626	ORGAN. N MUD D WT		MG/KG-N	WATER	TOT	10	1259.400	1525700	1235.200	3400.00	3.75	75/07/01	84/01/30
00627	KJELDL N TOT MU D		MG/KG	WATER		3	2090.000	4668400	2160.700	4381.000	89.000	86/01/30	87/12/21
00630	NO2&NO3	N-TOTAL	MG/L	WATER		132	.1158300	.0059906	.0773990	.50	.03	74/03/07	87/12/21
					K	2	.0200000	.0000000	.0000000	.02	.02	85/01/02	85/02/01
					TOT	134	.1144000	.0060365	.0776950	.50	.02	74/03/07	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		10	.2970000	.0234900	.1532700	.57	.09	74/03/07	75/04/08
00665	PHOS-TOT		MG/L P	WATER		112	.1567900	.0307630	.1753900	1.730	.040	75/07/29	87/12/21
					K	10	.0720000	.0065067	.0806640	.300	.020	74/11/26	87/10/26
					TOT	122	.1498400	.0292500	.1710300	1.730	.020	74/11/25	87/12/21
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		11	1366.500	2941600	1715.100	5800.0	5.6	77/02/22	87/12/21
00680	T ORG C	C	MG/L	WATER		46	6.933200	10.78900	3.284600	17.6	.6	74/11/25	87/10/26
					K	1	5.000000			5.0	5.0	78/11/24	78/11/24
					TOT	47	6.892100	10.63400	3.260900	17.6	.6	74/11/25	87/10/26
00900	TOT HARD	CACO3	MG/L	WATER		4	2926.000	535840.0	732.0100	3500	1900	79/01/18	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		2	220.0000	200.0000	14.14200	230.0	210.0	85/02/01	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		9	408.1100	10732.00	103.6000	543.0	250.0	75/03/12	76/03/25
00927	MGNSIUM	MG,TOT	MG/L	WATER		6	655.0000	2190.000	46.79800	720.0	610.0	85/02/01	86/05/12
01000	ARSENIC	AS,DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/25	74/11/25
01002	ARSENIC	AS,TOT	UG/L	WATER		1	5.000000			5	5	85/06/25	85/06/25
					K	3	5.000000	.0000000	.0000000	5	5	85/06/25	85/06/26
					TOT	4	5.000000	.0000000	.0000000	5	5	85/06/25	85/06/26
01003	ARSENIC	SEDMG/KG	DRY WGT	WATER		1	16.00000			16.00	16.00	86/01/30	86/01/30
01025	CADMIUM	CD,DISS	UG/L	WATER		2	20.00000	200.0000	14.14200	30	10	75/01/27	77/08/25
					K	15	17.33300	549.5300	23.44200	100	10	74/03/07	77/04/25
					TOT	17	17.64700	494.1200	22.22900	100	10	74/03/07	77/08/25
01027	CADMIUM	CD,TOT	UG/L	WATER		2	33.50000	480.5000	21.92000	49	18	78/04/24	78/07/13
					K	31	10.00000	.0000000	.0000000	10	10	78/10/26	87/10/26
					TOT	33	11.42400	47.44000	6.887600	49	10	78/04/24	87/10/26
01028	CD MUD	DRY WGT	MG/KG-CD	WATER		3	8.233300	146.3200	12.09700	22.20	1.10	77/02/22	85/02/01
					K	11	.9209100	.0297690	.1725400	1.00	.50	75/03/05	87/12/21
					TOT	14	2.487900	32.23000	5.677100	22.20	.50	75/03/05	87/12/21
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		14	22.33600	90.80600	9.529200	39.00	4.80	75/03/05	87/12/21
01030	CHROMIUM	CR,DISS	UG/L	WATER		1	90.00000			90	90	76/03/25	76/03/25
					K	16	53.12500	156.2500	12.50000	100	50	74/03/07	77/08/25
					TOT	17	55.29400	226.4700	15.04900	100	50	74/03/07	77/08/25
01034	CHROMIUM	CR,TOT	UG/L	WATER		1	50.00000			50	50	83/10/14	83/10/14
					K	32	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/26
					TOT	33	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/26

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/TYPE/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01040	COPPER	CU,DISS	UG/L	WATER		1	180.0000			180	180	74/11/25	74/11/25
					K	20	97.50000	125.0000	11.18000	100	50	74/03/07	77/08/25
					TOT	21	101.4300	442.8600	21.04400	180	50	74/03/07	77/08/25
01042	COPPER	CU,TOT	UG/L	WATER		1	70.00000			70	70	83/10/14	83/10/14
					K	42	63.09500	495.0700	22.25000	100	50	78/04/24	87/10/26
					TOT	43	63.25600	484.3900	22.00900	100	50	78/04/24	87/10/26
01043	COPPER	SEDMG/KG	DRY WGT	WATER		12	19.79000	212.3900	14.57400	60.00	7.48	75/03/05	87/12/21
					K	2	7.250000	.8450000	.9192400	7.90	6.60	75/07/01	77/02/22
					TOT	14	17.99900	200.5100	14.16000	60.00	6.60	75/03/05	87/12/21
01045	IRON	FE,TOT	UG/L	WATER		43	541.6300	79105.00	281.2600	1400	160	78/04/24	87/10/26
01046	IRON	FE,DISS	UG/L	WATER		22	597.5900	247770.0	497.7700	2220	180	74/03/07	77/08/25
01049	LEAD	PB,DISS	UG/L	WATER		18	166.6700	7329.400	85.61200	350	60	74/05/29	77/08/25
					K	4	87.50000	5625.000	75.00000	200	50	74/03/07	75/04/08
					TOT	22	152.2700	7713.600	87.82700	350	50	74/03/07	77/08/25
01051	LEAD	PB,TOT	UG/L	WATER		25	302.0000	16258.00	127.5100	590	50	78/04/24	84/04/16
					K	8	50.00000	.0000000	.0000000	50	50	86/01/30	87/10/26
					TOT	33	240.9100	24221.00	155.6300	590	50	78/04/24	87/10/26
01052	LEAD	SEDMG/KG	DRY WGT	WATER		14	29.99300	298.5900	17.28000	54.00	4.00	75/03/05	87/12/21
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		3	471.3300	157500.0	396.8600	928.00	210.00	75/03/05	86/01/30
01055	MANGNESE	MN	UG/L	WATER		23	76.52200	1796.500	42.38500	210.0	50.0	78/07/13	87/07/06
					K	20	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/26
					TOT	43	64.18600	1120.200	33.46900	210.0	50.0	78/04/24	87/10/26
01056	MANGNESE	MN,DISS	UG/L	WATER		7	65.71400	495.2400	22.25400	110.0	50.0	75/04/08	77/08/25
					K	7	50.00000	.0000000	.0000000	50.0	50.0	75/03/12	77/04/25
					TOT	14	57.85700	295.0600	17.17700	110.0	50.0	75/03/12	77/08/25
01065	NICKEL	NI,DISS	UG/L	WATER		8	111.2500	212.5000	14.57700	140	100	75/04/08	77/08/25
					K	6	100.0000	.0000000	.0000000	100	100	75/03/12	76/07/13
					TOT	14	106.4300	147.8100	12.15800	140	100	75/03/12	77/08/25
01067	NICKEL	NI,TOTAL	UG/L	WATER		30	141.3300	6053.400	77.80300	340	50	78/04/24	85/10/21
					K	13	53.84600	192.3100	13.86800	100	50	80/05/29	87/10/26
					TOT	43	114.8800	5867.500	76.73000	340	50	78/04/24	87/10/26
01068	NICKEL	SEDMG/KG	DRY WGT	WATER		14	9.978600	9.318700	3.052700	16.00	5.90	75/03/05	87/12/21
01090	ZINC	ZN,DISS	UG/L	WATER		1	170.0000			170	170	75/04/08	75/04/08
					K	14	100.0000	.0000000	.0000000	100	100	74/11/25	77/08/25
					TOT	15	104.6700	326.6700	18.07400	170	100	74/11/25	77/08/25
01092	ZINC	ZN,TOT	UG/L	WATER		23	123.0400	6567.600	81.04100	300	50	78/04/24	87/07/06
					K	20	57.50000	335.5300	18.31700	100	50	78/07/13	87/10/26
					TOT	43	92.55800	4686.200	68.45600	300	50	78/04/24	87/10/26
01093	ZINC	SEDMG/KG	DRY WGT	WATER		14	70.11400	1344.700	36.67000	160.00	34.00	75/03/05	87/12/21

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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01148	SELENIUM	SEDMG/KG	DRY WGT	WATER	K	1	.5000000			.50	.50	86/01/30	86/01/30
29519	INVALID	PAR	NUMBER	WATER	K	1	10.00000			10.00000	10.00000	80/02/13	80/02/13
31505	TOT COL I	MPN CONF	/100ML	WATER		4	322.2500	198640.0	445.5800	975	33	85/06/25	85/06/26
					L	1	2400.000			2400	2400	85/06/25	85/06/25
					TOT	5	737.8000	1012300	1006.100	2400	33	85/06/25	85/06/26
31615	FEC COL I	MPNECMED	/100ML	WATER		5	184.6000	47886.00	218.8300	540	10	85/06/25	85/06/26
					J	1	20.00000			20	20	80/12/18	80/12/18
					TOT	6	157.1700	42924.00	206.9400	540	10	80/12/18	85/06/26
31616	FEC COL I	MFM-FCBR	/100ML	WATER		97	493.0700	7161000	2676.000	26300	2	74/03/07	87/12/21
					J	42	207.3600	203250.0	450.8300	2700	4	76/09/13	87/08/28
					L	2	430.0000	273800.0	523.2600	800	60	74/08/21	79/08/09
					TOT	141	407.0700	4989000	2233.600	26300	2	74/03/07	87/12/21
31677	FECSTREP	MPNADEVA	/100ML	WATER		1	130.0000			130	130	75/03/05	75/03/05
34257	BETA BHC	SLDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.000	2.000	86/12/04	87/12/21
34354	ENDSULSF	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34359	BENDESUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34364	AENDOSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34369	ENDRINAL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
39076	ALPHABHC	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.000	2.000	86/12/04	87/12/21
39301	P,P'DDT	SEDUG/KG	DRY WGT	WATER		1	2.600000			2.60	2.60	78/05/03	78/05/03
					K	11	2.100000	1.250000	1.118000	5.00	.10	75/07/01	87/12/21
					TOT	12	2.141700	1.157200	1.075700	5.00	.10	75/07/01	87/12/21
39306	O,P' DDT	MUD DRY	UG/KG	WATER		1	7.800000			7.80	7.80	81/01/26	81/01/26
					K	11	2.100000	1.250000	1.118000	5.00	.10	75/07/01	87/12/21
					TOT	12	2.575000	3.843900	1.960600	7.80	.10	75/07/01	87/12/21
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER	K	12	2.091700	1.137200	1.066400	5.00	.10	75/07/01	87/12/21
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	12	2.091700	1.137200	1.066400	5.00	.10	75/07/01	87/12/21
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER		2	3.525000	.2112400	.4596100	3.85	3.20	76/05/03	85/02/01
					K	10	2.110000	1.387700	1.178000	5.00	.10	75/07/01	87/12/21
					TOT	12	2.345800	1.458000	1.207500	5.00	.10	75/07/01	87/12/21
39328	O,P'EDE	MUD	UG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	86/12/04	87/12/21
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	12	1.925000	.4129600	.6426200	3.00	.10	75/07/01	87/12/21
39343	GBHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/07/01	75/07/01
39351	CDANEDRY	TECHEMET	MUDUG/KG	WATER		1	7.860000			7.86	7.86	84/01/30	84/01/30
					K	2	2.000000	.0000000	.0000000	2.00	2.00	86/12/04	87/12/21
					TOT	3	3.953300	11.44700	3.383300	7.86	2.00	84/01/30	87/12/21
39383	DIELERIN	SEDUG/KG	DRY WGT	WATER	K	12	2.508300	5.864500	2.421700	10.00	.10	75/07/01	87/12/21
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	11	2.554600	6.422700	2.534300	10.00	.10	75/07/01	87/12/21
39399	ETHION	MUD	UG/KG	WATER	K	9	3.666700	1.000000	1.000000	4.00	1.00	75/07/01	87/12/21

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TYP-A/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	12	5.841700	193.6800	13.91700	50.00	.10	75/07/01	87/12/21
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	12	1.925000	.4129600	.6426200	3.00	.10	75/07/01	87/12/21
39423	HCCHLREP	SEDUG/KG	DRY WGT	WATER	K	12	2.508300	5.864500	2.421700	10.00	.10	75/07/01	87/12/21
39481	MTHXYCLR	MUD DRY	UG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	86/12/04	87/12/21
39491	PCB-1221	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39495	PCB-1232	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39499	PCB-1242	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39503	PCB-1248	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39507	PCB-1254	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39511	PCB-1260	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39514	PCB-1016	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39519	PCBS	MUD	UG/KG	WATER	K	9	20.00000	900.0000	30.00000	100.00	10.00	78/05/03	86/12/04
39531	MALATHN	MUD	UG/KG	WATER	K	10	8.300000	215.5700	14.68200	50.00	1.00	75/07/01	87/12/21
39541	PARATHN	MUD	UG/KG	WATER	K	10	6.300000	70.23300	8.380500	30.00	1.00	75/07/01	87/12/21
39571	DIAZINON	MUD	UG/KG	WATER	K	9	3.666700	1.000000	1.000000	4.00	1.00	75/07/01	87/12/21
39581	GUTHION	MUD DRY	UG/KG	WATER	K	9	3.666700	1.000000	1.000000	4.00	1.00	75/07/01	87/12/21
39701	HCB	SEDUG/KG	DRY WGT	WATER	K	1	4.000000			4.00	4.00	87/12/21	87/12/21
39758	MIREX	DOT MAT	UG/KG	WATER	K	2	3.000000	2.000000	1.414200	4.00	2.00	86/12/04	87/12/21
39783	LINDANE	MUD DRY	UG/KG	WATER	K	12	2.091700	1.137200	1.066400	5.00	.10	75/07/01	87/12/21
39787	TRITHION	MUD	UG/KG	WATER	K	9	3.666700	1.000000	1.000000	4.00	1.00	75/07/01	87/12/21
46570	CAL HARD	CA MG	MG/L	WATER	$	2	3473.100	8784.000	93.72300	3539	3407	85/02/01	86/05/12
70310	PH	SU	DOT MUD	WATER		6	7.216700	.1257300	.3545900	7.7	6.8	82/02/19	87/12/21
70320	MOISTURE	CONTENT	PERCENT	WATER		13	65.00000	159.1300	12.61500	76	37	75/07/01	87/12/21
70322	RESIDUE	TOT VOL	PERCENT	WATER		13	11.04600	21.06100	4.589200	22.0	4.2	75/07/01	87/12/21
70507	PHOS-T	ORTHO	MG/L P	WATER		10	.0920000	.0024845	.0498440	.190	.040	75/07/29	85/06/26
71900	MERCURY	HG,TOTAL	UG/L	WATER		39	.8997400	1.135300	1.065500	6.3	.2	74/03/07	87/10/26
					K	24	.3000000	.0286960	.1694000	.8	.2	75/07/29	87/07/06
					TOT	63	.6712700	.7926600	.8903200	6.3	.2	74/03/07	87/10/26
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		4	.3325000	.0247590	.1573530	.6	.2	75/03/05	80/02/13
					K	9	.2333300	.0006250	.0250010	.3	.2	77/02/22	87/12/21
					TOT	13	.2638500	.0088757	.0942110	.6	.2	75/03/05	87/12/21
74041	WQF	SAMPLE	UPDATED	WATER		203	868170.0	42358000	6508.300	880804	860529	84/07/25	87/12/21
78453	PCB-1262	SED DRY	WT UG/KG	WATER	K	1	10.00000			10.000	10.000	87/12/21	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.1600000			.16	.16	75/07/01	75/07/01
82028	RATIO	FEC COL	FEC STRP	WATER	$	1	1.769200			2	2	75/03/05	75/03/05
82048	DOT LPTH	OF SMPL	METERS	WATER		769	4.133100	11.08100	3.328900	14.00	.30	74/04/23	87/12/21
82078	TURBIDIT	Y FIELD	NTU	WATER		1	8.000000			8.0	8.0	83/03/25	83/03/25

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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		292	49.93200	.6836300	.8268200	50.0	40.0	74/01/02	87/12/21
00010	WATER	TEMP	CENT	WATER		649	19.42400	53.59300	7.320700	35.0	7.0	74/01/02	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	649	66.96000	173.5500	13.17400	95.0	44.6	74/01/02	87/12/21
00020	AIR	TEMP	CENT	WATER		199	19.74600	54.70500	7.396300	55.0	6.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		2	24.00000	2.000000	1.414200	25.0	23.0	81/03/31	81/05/28
00041	WEATHER	WMO CODE	4501	WATER		199	.7035200	.8359000	.9142700	2	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		56	2571.400	729700.0	854.2300	4200	2000	81/03/31	87/12/21
00075	TURB	HLGE	FPM SIO2	WATER		1	23.60000			23.5	23.5	74/03/07	74/03/07
00076	TURB	TRBIDMTR	HACH FTU	WATER		140	8.100000	32.36700	5.689200	34.0	1.0	74/05/29	87/12/21
00080	COLOR	PT-CO	UNITS	WATER		19	28.36300	214.1600	14.63400	70	4	74/03/07	81/06/06
00300	DO		MG/L	WATER		649	7.348500	4.552300	2.133600	12.4	2.0	74/01/02	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	649	76.17600	178.5800	13.36300	120.6	25.6	74/01/02	87/12/21
00306	BOD	4 DAY	MG/L	WATER		1	3.300000			3.3	3.3	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		143	1.830100	.6014900	.7755600	4.6	.6	74/04/23	87/11/24
00312	BOD	6 DAY	MG/L	WATER		1	2.000000			2.0	2.0	74/03/07	74/03/07
00322	BOD	10 DAY	MG/L	WATER		1	1.600000			1.6	1.6	78/11/24	78/11/24
00339	COD MUD	DRY WGT	MG/KG	WATER		1	25000.00			25000	25000	75/01/29	75/01/29
00340	COD	HI LEVEL	MG/L	WATER		7	266.1400	30491.00	174.6200	480	24	74/09/19	76/03/25
00400	PH		SU	WATER		146	7.664400	.1782100	.4221500	8.80	6.40	74/01/02	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		608	28280.00	61005000	7810.600	44000	2900	78/04/24	87/12/21
00403	PH	LAB	SU	WATER		149	7.521400	.2235000	.4727600	8.1	4.2	74/03/07	87/12/21
00410	T ALK	CACO3	MG/L	WATER		148	77.84700	389.4800	19.73500	120	0	74/03/07	87/12/21
00480	SALINITY		PPTH	WATER		616	20.41800	24.16600	4.915900	33.0	.0	74/09/19	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		1	200.0000			200	200	78/04/24	78/04/24
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		1	500.0000			500.000	500.000	75/01/29	75/01/29
00610	NH3+NH4-	N TOTAL	MG/L	WATER		97	.2611300	.0620300	.2490600	1.800	.050	75/04/08	87/12/21
					K	23	.0482610	.0004786	.0218790	.110	.020	74/11/25	87/09/29
					TOT	120	.2203300	.0572090	.2391900	1.800	.020	74/11/25	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	90	.0058752	.0000820	.0090605	.073	.0001	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	90	.0071436	.0001213	.0110170	.089	.0002	76/03/25	87/12/21
00 25	TOT KJEL	N	MG/L	WATER		116	.7067200	.2790100	.5282100	3.500	.050	74/12/30	87/12/21
					K	7	.1085700	.0022476	.0474090	.200	.040	74/11/25	85/02/01
					TOT	123	.6726800	.2924700	.5314800	3.500	.040	74/11/25	87/12/21
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		1	382.6000			382.60	382.60	75/01/29	75/01/29
00630	NO2&NO3	N-TOTAL	MG/L	WATER		136	.1151500	.0150960	.1228700	1.06	.02	74/03/07	87/12/21
					K	1	.0200000			.02	.02	87/11/24	87/11/24
					TOT	137	.1144500	.0150510	.1226800	1.06	.02	74/03/07	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		13	.2300000	.0123500	.1111300	.51	.06	74/03/07	75/04/08
					K	2	.0600000	.0000000	.0000000	.06	.06	75/03/06	75/04/11

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00660	ORTHOPO4	PO4	MG/L	WATER	TOT	15	.2073300	.0141640	.1190100	.51	.06	74/03/07	75/04/11
00665	PHOS-TOT		MG/L P	WATER		111	.1082900	.0045068	.0671330	.420	.040	74/12/30	87/11/24
					K	11	.0836360	.0073455	.0857060	.300	.020	74/11/25	87/12/21
					TOT	122	.1060700	.0047544	.0689520	.420	.020	74/11/25	87/12/21
00680	T ORG C	C	MG/L	WATER		46	6.286500	12.89000	3.590300	22.1	2.2	74/11/25	87/10/26
					K	1	5.000000			5.0	5.0	78/11/24	78/11/24
					TOT	47	6.259100	12.64500	3.556030	22.1	2.2	74/11/25	87/10/26
00900	TOT HARD	CACO3	MG/L	WATER		4	3325.000	395840.0	629.1500	3900	2600	79/01/18	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		2	250.0000	200.0000	14.14200	260.0	240.0	85/02/01	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		13	329.8000	36952.00	192.2300	664.0	11.3	74/12/30	76/03/25
00927	MGNSIUM	MG,TOT	MG/L	WATER		2	785.0000	450.0000	21.21300	800.0	770.0	85/02/01	86/05/12
00940	CHLORIDE	TOTAL	MG/L	WATER		1	33.00000			33	33	75/03/06	75/03/06
01000	ARSENIC	AS,DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/25	74/11/25
01025	CADMIUM	CD,DISS	UG/L	WATER		4	23.25000	88.91700	9.429600	30	10	74/05/29	77/10/05
					K	18	15.00000	450.0000	21.21300	100	10	74/03/07	77/04/25
					TOT	22	16.60000	387.6000	19.68800	100	10	74/03/07	77/10/05
01027	CADMIUM	CD,TOT	UG/L	WATER		9	29.55600	149.5300	12.22800	55	22	78/04/24	85/10/21
					K	30	10.00000	.0000000	.0000000	10	10	78/10/26	87/10/26
					TOT	39	14.51300	101.1500	10.05700	55	10	78/04/24	87/10/26
01028	CD MUD	DRY WGT	MG/KG-CD	WATER		1	11.05000			11.05	11.05	75/01/29	75/01/29
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		1	6.030000			6.03	6.03	75/01/29	75/01/29
01030	CHROMIUM	CR,DISS	UG/L	WATER		1	60.00000			60	60	76/03/25	76/03/25
					K	21	52.38100	119.0500	10.91100	100	50	74/03/07	77/10/05
					TOT	22	52.72700	116.0200	10.77100	100	50	74/03/07	77/10/05
01034	CHROMIUM	CR,TOT	UG/L	WATER		7	287.1400	17124.00	130.8600	460	50	83/10/14	85/10/21
					K	32	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/26
					TOT	39	92.56400	11204.00	105.8500	460	50	78/04/24	87/10/26
0104	COPPER	CU,DISS	UG/L	WATER		3	460.0000	308800.0	555.7000	1100	100	74/11/25	75/04/11
					K	25	98.00000	100.0000	10.00000	100	50	74/03/07	77/10/05
					TOT	28	136.7900	35963.00	189.6400	1100	50	74/03/07	77/10/05
01042	COPPER	CU,TOT	UG/L	WATER		2	85.00000	450.0000	21.21300	100	70	78/07/13	83/10/14
					K	37	63.51400	506.7600	22.51100	100	50	78/04/24	87/10/26
					TOT	39	64.61500	514.9800	22.69300	100	50	78/04/24	87/10/26
01043	COPPER	SEDMG/KG	DRY WGT	WATER	K	1	10.04000			10.04	10.04	75/01/29	75/01/29
01045	IRON	FE,TOT	UG/L	WATER		39	552.8200	134140.0	366.2500	1900	170	78/04/24	87/10/26
01046	IRON	FE,DISS	UG/L	WATER		29	657.5900	308190.0	555.1500	2900	100	74/03/07	77/10/05
01049	LEAD	PB,DISS	UG/L	WATER		18	157.1700	4385.700	66.22500	300	59	74/05/29	77/10/05
					K	11	63.63600	2045.500	45.22700	200	50	74/03/07	75/06/05
					TOT	29	121.6900	5526.400	74.34000	300	50	74/03/07	77/10/05

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01051	LEAD	PB.TOT	UG/L	WATER		31	303.8700	19378.00	139.2100	700	120	78/04/24	85/10/21
					K	8	50.00000	.0000000	.0000000	50	50	86/01/30	87/10/26
					TOT	39	261.8000	26084.00	161.5100	700	50	78/04/24	87/10/26
01052	LEAD	SEDMG/KG	DRY WGT	WATER		1	40.18000			40.18	40.18	75/01/29	75/01/29
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	59.26000			59.26	59.26	75/01/29	75/01/29
01055	MANGNESE	MN	UG/L	WATER		14	70.71400	1130.200	33.61900	180.0	50.0	78/07/13	84/04/16
					K	25	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/26
					TOT	39	57.43600	487.9900	22.09100	180.0	50.0	78/04/24	87/10/26
01056	MANGNESE	MN.DISS	UG/L	WATER		12	187.7500	77479.00	278.3500	950.0	50.0	74/12/30	77/08/25
					K	8	50.00000	.0000000	.0000000	50.0	50.0	75/03/06	77/10/05
					TOT	20	132.6500	49650.00	222.8200	950.0	50.0	74/12/30	77/10/05
01065	NICKEL	NI.DISS	UG/L	WATER		11	144.5500	5087.300	71.32500	290	100	75/03/12	77/10/05
					K	9	100.0000	.0000000	.0000000	100	100	74/12/30	76/07/13
					TOT	20	124.5000	3194.500	56.52000	290	100	74/12/30	77/10/05
01067	NICKEL	NI.TOTAL	UG/L	WATER		27	161.4800	6105.400	78.13700	370	50	78/04/24	85/10/21
					K	12	50.00000	.0000000	.0000000	50	50	84/08/06	87/10/26
					TOT	39	127.1800	6894.500	83.03300	370	50	78/04/24	87/10/26
01068	NICKEL	SEDMG/KG	DRY WGT	WATER	K	1	10.04000			10.04	10.04	75/01/29	75/01/29
01090	ZINC	ZN.DISS	UG/L	WATER		5	240.0000	36000.00	189.7400	570	110	74/12/30	75/04/11
					K	16	100.0000	.0000000	.0000000	100	100	74/11/25	77/10/05
					TOT	21	133.3300	10933.00	104.5600	570	100	74/11/25	77/10/05
01092	ZINC	ZN.TOT	UG/L	WATER		19	104.7400	1848.600	42.99500	200	60	78/04/24	87/07/06
					K	20	62.50000	493.4200	22.21300	100	50	78/10/26	87/10/26
					TOT	39	83.07700	1579.800	39.74600	200	50	78/04/24	87/10/26
01093	ZINC	SEDMG/KG	DRY WGT	WATER		1	37.16000			37.16	37.16	75/01/29	75/01/29
31508	TOT COLI	MPN COMP	TUBECODE	WATER		1	94.00000			94	94	75/02/11	75/02/11
31615	FEC COLI	MPNECMED	/100ML	WATER		1	84.00000			84	84	81/03/31	81/03/31
31616	FEC COLI	MFM-FCBR	/100ML	WATER		105	435.7900	8334400	2886.900	29700	3	74/03/07	87/12/21
					J	42	247.1400	542270.0	736.3900	4600	4	77/02/22	87/11/24
					K	1	2.000000			2	2	81/01/26	81/01/26
					L	2	150.0000	16200.00	127.2800	240	60	79/08/09	83/07/05
					TOT	150	376.2700	5975500	2444.500	29700	2	74/03/07	87/12/21
39301	P.P'DDT	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39306	O.P' DDT	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39311	P.P'DDD	SEDUG/KG	DRY WGT	WATER		1	.4200000			.42	.42	75/01/29	75/01/29
39316	O.P' DDD	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39321	P.P'DDE	SEDUG/KG	DRY WGT	WATER		1	.1300000			.13	.13	75/01/29	75/01/29
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39343	GEMC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29

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39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39399	ETHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/29	75/01/29
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39531	MALATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/29	75/01/29
39541	PARATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/29	75/01/29
39571	DIAZINON	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/29	75/01/29
39581	GUTHION	MUD DRY	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/29	75/01/29
39783	LINDANE	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/01/29	75/01/29
39787	TRITHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/29	75/01/29
4657	CAL HARD	CA MG	MG/L	WATER	$	2	3856.900	15040.00	122.6400	3944	3770	86/02/01	86/05/12
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	1.020000			1.0	1.0	75/01/29	75/01/29
70507	PHOS-T	ORTHO	MG/L P	WATER		7	.0642860	.0028286	.0531840	.180	.020	75/06/05	76/06/17
71900	MERCURY	HG,TOTAL	UG/L	WATER		41	1.028300	1.431000	1.196300	5.3	.2	74/03/07	85/07/05
					K	25	.2960000	.0279000	.1670300	.8	.2	75/07/29	87/10/26
					TOT	66	.7509100	1.019100	1.009500	5.3	.2	74/03/07	87/10/26
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		1	.1100000			.1	.1	75/01/29	75/01/29
74041	WQF	SAMPLE	UPLATED	WATER		122	868450.0	38546000	6208.600	880419	860529	86/03/24	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.3200000			.32	.32	75/01/29	75/01/29
82048	BOT EPTH	OF SMPL	METERS	WATER		649	3.398600	8.097000	2.845530	13.00	.30	74/01/02	87/12/21

MD-034
32 45 50.0 079 56 50.0 3
RT BANK ASHLEY RVR AT MOUTH OF JAMES ISLAND CK
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030614
SANTEE COOPER MARINE
21SC60WQ HQ 03050202006 0000.140 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		254	49.74400	17.22800	4.150700	90.0	20.0	74/03/07	87/12/21
00010	WATER	TEMP	CENT	WATER		575	19.48700	50.38600	7.098300	33.0	7.0	74/04/23	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	575	67.07400	163.2000	12.77500	91.4	44.6	74/04/23	87/12/21
00020	AIR	TEMP	CENT	WATER		182	19.84300	56.80600	7.537000	55.0	6.0	80/02/13	87/12/21
00021	AIR	TEMP	FAHN	WATER		2	24.00000	2.000000	1.414200	25.0	23.0	81/03/31	81/05/28
00041	WEATHER	WMO CODE	4501	WATER		182	.6978000	.8308200	.9115000	2	0	80/02/13	87/12/21
00048	TOT PART	PRESSURE	% SAT	WATER		1	11.50000			11.5	11.5	82/06/24	82/06/24
00067	TIDE	STAGE	CODE	WATER		56	2755.400	875230.0	935.5400	4200	2000	81/03/31	87/12/21
00075	TURB	HLGE	PPM SIO2	WATER		1	28.00000			28.0	28.0	74/03/07	74/03/07
00076	TURB	TRBIDMTR	HACH FTU	WATER		134	8.108900	66.74700	8.169900	80.0	.8	74/05/29	87/12/21
00078	TRANSP	SECCHI	METERS	WATER		1	1.000000			1.00	1.00	85/07/05	85/07/05
00080	COLOR	PT-CO	UNITS	WATER		16	25.28100	66.26600	8.140400	40	5	74/03/07	78/04/24
00300	DO		MG/L	WATER		574	7.215600	3.785700	1.945700	12.2	2.2	74/04/23	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	574	75.20500	150.5200	12.26900	125.7	28.9	74/04/23	87/12/21
00306	BOD	4 DAY	MG/L	WATER		1	4.700000			4.7	4.7	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		135	1.822200	.8707400	.9331400	6.6	.3	74/04/23	87/12/21
00312	BOD	6 DAY	MG/L	WATER		1	2.050000			2.1	2.1	74/03/07	74/03/07
00322	BOD	10 DAY	MG/L	WATER		1	1.500000			1.5	1.5	78/11/24	78/11/24
00335	COD	LOWLEVEL	MG/L	WATER		1	73.00000			73.0	73.0	86/07/31	86/07/31
00339	COD MUD	DRY WGT	MG/KG	WATER		1	16000.00			16000	16000	75/01/27	75/01/27
00340	COD	HI LEVEL	MG/L	WATER		6	253.8300	11396.00	106.7500	400	88	74/09/19	76/03/25
00400	PH		SU	WATER		137	7.701400	.1493000	.3863900	8.60	6.20	74/04/23	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		541	29105.00	58481000	7647.300	45000	11000	78/04/24	87/12/21
00403	PH	LAB	SU	WATER		142	7.599900	.1411500	.3757000	8.0	5.5	74/03/07	87/12/21
00410	T ALK	CACO3	MG/L	WATER		142	80.41600	286.1900	16.91700	130	45	74/03/07	87/12/21
00415	PHEN-PH-	LFIN ALK	MG/L	WATER		1	7.900000			8	8	80/12/18	80/12/18
00480	SALINITY		PPTH	WATER		547	21.17000	28.06600	5.297700	36.0	7.8	74/09/19	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		2	37.00000	338.0000	18.38500	50	24	82/03/05	83/11/01
					J	1	22.00000			22	22	78/04/24	78/04/24
					TOT	3	32.00000	244.0000	15.62100	50	22	78/04/24	83/11/01
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		1	510.0000			510.000	510.000	75/01/27	75/01/27
00610	NH3+NH4-	N TOTAL	MG/L	WATER		101	.2798000	.0939870	.3065700	2.000	.050	75/04/08	87/12/21
					K	18	.0450000	.0001323	.0115050	.050	.020	74/11/25	87/08/28
					TOT	119	.2442800	.0868070	.2946300	2.000	.020	74/11/25	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	94	.0061626	.0000562	.0074989	.034	.0003	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	94	.0074931	.0000831	.0091178	.041	.0003	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		110	.7264500	.3247100	.5698300	4.000	.050	75/01/27	87/12/21
					K	6	.1033300	.0000666	.0081647	.120	.100	74/11/25	85/02/01
					TOT	116	.6942200	.3269800	.5718200	4.000	.050	74/11/25	87/12/21

MD-034
32 45 50.0 079 56 50.0 3
RT BANK ASHLEY RVR AT MOUTH OF JAMES ISLAND CK
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER MARINE
21SC60WQ HQ 03050202006 0000.140 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		1	146.8000			146.80	146.80	75/01/27	75/01/27
00630	NO2&NO3	N-TOTAL	MG/L	WATER		128	.0944530	.0031302	.0559480	.38	.03	74/03/07	87/12/21
					K	2	.0200000	.0000000	.0000000	.02	.02	82/11/19	85/01/02
					TOT	130	.0933070	.0031663	.0562700	.38	.02	74/03/07	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		10	.2220000	.0048401	.0695710	.30	.12	74/03/07	75/04/08
00665	PHOS-TOT		MG/L P	WATER		101	.1053500	.0049930	.0706610	.480	.030	76/01/23	87/09/29
					K	15	.0766670	.0053096	.0728670	.300	.050	74/11/25	87/12/21
					TOT	116	.1016400	.0050815	.0712850	.480	.030	74/11/25	87/12/21
00680	T ORG C	C	MG/L	WATER		46	5.846500	11.96600	3.459200	18.1	1.9	74/11/25	87/10/26
					K	2	3.000000	8.000000	2.828400	5.0	1.0	78/11/24	81/10/27
					TOT	48	5.727900	11.95700	3.457900	18.1	1.0	74/11/25	87/10/26
00900	TOT HARD	CACO3	MG/L	WATER		4	3475.000	329170.0	573.7300	4000	2800	79/01/18	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		2	245.0000	450.0000	21.21300	260.0	230.0	85/02/01	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		9	703.1100	729870.0	854.3300	2970.0	270.0	75/03/12	76/03/25
00927	MGNSIUM	MG,TOT	MG/L	WATER		2	805.0000	50.00000	7.071100	810.0	800.0	85/02/01	86/05/12
01000	ARSENIC	AS,DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/25	74/11/25
01025	CADMIUM	CD,DISS	UG/L	WATER		3	101.6700	18958.00	137.6900	260	10	75/04/08	77/08/25
					K	15	17.33300	549.6300	23.44200	100	10	74/03/07	77/04/25
					TOT	18	31.38900	3728.800	61.06400	260	10	74/03/07	77/08/25
01027	CADMIUM	CD,TOT	UG/L	WATER		2	34.50000	264.5000	16.26400	46	23	78/04/24	78/07/13
					K	31	10.00000	.0000000	.0000000	10	10	78/10/26	87/10/26
					TOT	33	11.48500	43.60800	6.596000	46	10	78/04/24	87/10/26
01028	CD MUD	DRY WGT	MG/KG-CD	WATER		1	11.18000			11.18	11.18	75/01/27	75/01/27
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		1	3.890000			3.89	3.89	75/01/27	75/01/27
01030	CHROMIUM	CR,DISS	UG/L	WATER		2	50.00000	.0000000	.0000000	50	50	76/03/25	76/07/27
					K	16	53.12500	156.2500	12.50000	100	50	74/03/07	77/08/25
					TOT	18	52.77800	138.8900	11.78500	100	50	74/03/07	77/08/25
01034	CHROMIUM	CR,TOT	UG/L	WATER	K	33	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/26
01040	COPPER	CU,DISS	UG/L	WATER		1	200.0000			200	200	74/11/25	74/11/25
					K	21	97.61900	119.0500	10.91100	100	50	74/03/07	77/08/25
					TOT	22	102.2700	589.8300	24.28700	200	50	74/03/07	77/08/25
01042	COPPER	CU,TOT	UG/L	WATER		1	60.00000			60	60	83/10/14	83/10/14
					K	38	64.47400	528.1000	22.98000	100	50	78/04/24	87/10/26
					TOT	39	64.35900	514.7100	22.68700	100	50	78/04/24	87/10/26
01043	COPPER	SEDMG/KG	DRY WGT	WATER		1	4.860000			4.86	4.86	75/01/27	75/01/27
01045	IRON	FE,TOT	UG/L	WATER		39	514.3600	67015.00	258.8700	1300	150	78/04/24	87/10/26
01046	IRON	FE,DISS	UG/L	WATER		23	638.8700	320920.0	566.5000	2550	180	74/03/07	77/08/25
01049	LEAD	PB,DISS	UG/L	WATER		18	160.2200	3525.600	59.37700	250	54	74/05/29	77/08/25
					K	5	80.00000	4500.000	67.08200	200	50	74/03/07	75/06/05

MD-034
32 45 50.0 079 56 50.0 3
RT BANK ASHLEY RVR AT MOUTH OF JAMES ISLAND CK
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER MARINE
21SC60WQ HQ 03050202006 0000.140 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01049	LEAD	PB,DISS	UG/L	WATER	TOT	23	142.7800	4687.200	68.46300	250	50	74/03/07	77/08/25
01051	LEAD	PB,TOT	UG/L	WATER		25	318.0000	14167.00	119.0200	560	130	78/04/24	84/04/16
					K	8	50.00000	.0000000	.0000000	50	50	86/01/30	87/10/26
					TOT	33	253.0300	24228.00	155.6500	560	50	78/04/24	87/10/26
01052	LEAD	SEDMG/KG	DRY WGT	WATER		1	2.920000			2.92	2.92	75/01/27	75/01/27
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	27.70000			27.70	27.70	75/01/27	75/01/27
01055	MANGNESE	MN	UG/L	WATER		12	70.83300	1262.900	35.53700	180.0	50.0	76/07/13	84/04/16
					K	27	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/26
					TOT	39	56.41000	460.4600	21.45800	180.0	50.0	76/04/24	87/10/26
01056	MANGNESE	MN,DISS	UG/L	WATER		7	68.57200	314.2900	17.72800	100.0	50.0	75/04/08	77/08/25
					K	8	50.00000	.0000000	.0000000	50.0	50.0	75/03/12	76/10/26
					TOT	15	58.66700	226.6700	15.05600	100.0	50.0	75/03/12	77/08/25
01065	NICKEL	NI,DISS	UG/L	WATER		11	131.8200	2716.400	52.11900	270	100	75/03/12	77/08/25
					K	4	100.0000	.0000000	.0000000	100	100	75/07/29	76/07/13
					TOT	15	123.3300	2152.400	46.39400	270	100	75/03/12	77/08/25
01067	NICKEL	NI,TOTAL	UG/L	WATER		28	157.1400	6717.500	81.96000	390	50	78/04/24	85/10/21
					K	11	50.00000	.0000000	.0000000	50	50	84/08/06	87/10/26
					TOT	39	126.9200	7158.700	84.60900	390	50	78/04/24	87/10/26
01068	NICKEL	SEDMG/KG	DRY WGT	WATER	K	1	4.860000			4.86	4.86	75/01/27	75/01/27
01090	ZINC	ZN,DISS	UG/L	WATER		1	250.0000			250	250	75/04/08	75/04/08
					K	15	100.0000	.0000000	.0000000	100	100	74/11/25	77/08/25
					TOT	16	109.3800	1406.300	37.50000	250	100	74/11/25	77/08/25
01092	ZINC	ZN,TOT	UG/L	WATER		20	145.5000	28226.00	168.0100	800	50	78/04/24	87/07/06
					K	19	60.52600	438.6000	20.94300	100	50	78/10/26	87/10/26
					TOT	39	104.1000	16172.00	127.1700	800	50	78/04/24	87/10/26
01093	ZINC	SEDMG/KG	DRY WGT	WATER		1	13.61000			13.61	13.61	75/01/27	75/01/27
31616	FEC COLI	MFM-FCBR	/100ML	WATER		100	451.2000	9239100	3039.600	30500	4	74/03/07	87/12/21
					J	35	223.2000	115010.0	339.1300	1400	2	76/09/13	87/10/26
					K	3	268.0000	212270.0	460.7300	800	2	74/04/23	79/01/18
					L	5	1652.000	5999500	2449.400	6000	60	74/08/21	84/05/18
					TOT	143	433.5400	6704900	2589.400	30500	2	74/03/07	87/12/21
39301	P,P'DDT	SEDUG/KG	DRY WGT	WATER		1	.6800000			.68	.68	75/01/27	75/01/27
3930	O,P' DDT	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER		1	.4100000			.41	.41	75/01/27	75/01/27
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER		1	.1200000			.12	.12	75/01/27	75/01/27
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39343	GEHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27

/TYPA/AMBNT/STREAM

MD-034
32 45 50.0 079 56 50.0 3
RT BANK ASHLEY RVR AT MOUTH OF JAMES ISLAND CK
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER MARINE
21SC60WQ HQ 03050202006 0000.140 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39393	ENDRIN	SLDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39399	ETHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/27	75/01/27
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39531	MALATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/27	75/01/27
39541	PARATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/27	75/01/27
39571	DIAZINON	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/27	75/01/27
39581	GUTHION	MUD DRY	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/27	75/01/27
39783	LINDANE	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/01/27	75/01/27
39787	TRITHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/01/27	75/01/27
46570	CAL HARD	CA MG	MG/L	WATER	$	2	3926.800	6736.000	82.07300	3985	3869	85/02/01	86/05/12
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	1.900000			1.9	1.9	75/01/27	75/01/27
70507	PHOS-T	ORTHO	MG/L P	WATER		7	.0471430	.0010572	.0325140	.110	.020	76/06/05	76/06/17
71900	MERCURY	HG.TOTAL	UG/L	WATER		36	1.046700	1.834700	1.354510	7.3	.2	74/03/07	85/10/21
					K	24	.3125000	.0298370	.1727300	.8	.2	75/07/29	87/10/26
					TOT	60	.7530000	1.231600	1.109800	7.3	.2	74/03/07	87/10/26
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		1	.0800000			.08	.08	75/01/27	75/01/27
74041	WQF	SAMPLE	UPDATED	WATER		100	869270.0	42367000	6509.000	880419	860529	84/08/06	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.2200000			.22	.22	75/01/27	75/01/27
82048	BOT EPTH	OF SMPL	METERS	WATER		572	3.203300	7.682000	2.771600	13.00	.30	74/04/23	87/12/21

/TYPA/AMENT/STREAM

MD-044
32 52 50.0 079 57 00.0 3
COOPER RVR AB SHIPYARD CK AT BUOY 49
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030810
SANTEE COOPER MARINE DIST
21SC60WQ 03050201003 0001.980 ON
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		285	50.14000	5.614900	2.369600	90.0	50.0	74/02/14	87/12/21
00010	WATER	TEMP	CENT	WATER		856	19.80700	54.61900	7.390400	33.0	2.6	74/05/21	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	856	67.65000	176.8400	13.29800	91.4	36.7	74/05/21	87/12/21
00020	AIR	TEMP	CENT	WATER		207	21.06000	50.55400	7.110100	40.5	5.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		3	23.66700	22.33400	4.725900	29.0	20.0	81/02/17	81/05/19
00041	WEATHER	WMO CODE	4501	WATER		211	.9241700	4.946600	2.224100	22	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		73	2513.700	778680.0	882.4300	4300	2000	81/03/10	87/12/21
00076	TURB	TRBIDMTR	HACH FTU	WATER		136	6.856600	54.64400	7.385400	70.0	.8	74/02/14	87/12/21
00080	COLOR	PT-CO	UNITS	WATER		18	30.78300	237.8900	15.42400	60	6	74/02/14	78/04/24
00300	DO		MG/L	WATER		865	7.203400	4.986600	2.233100	19.0	2.8	74/05/21	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	855	75.06600	213.4200	14.60900	195.9	34.1	74/05/21	87/12/21
00310	BOD	5 DAY	MG/L	WATER		130	1.583800	.7092800	.8421900	6.8	.4	74/02/14	87/12/21
					K	8	1.000000	.0000000	.0000000	1.0	1.0	76/03/25	84/12/14
					TOT	138	1.550000	.6866200	.8286200	6.8	.4	74/02/14	87/12/21
00339	COD MUD	DRY WGT	MG/KG	WATER		1	127000.0			127000	127000	75/02/25	75/02/25
00340	COD	HI LEVEL	MG/L	WATER		5	51.00000	851.0000	29.17200	98	28	75/12/12	76/03/25
00400	PH		SU	WATER		134	7.555200	.3191700	.5649500	9.00	4.10	74/05/21	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		809	15964.00	1878E405	13705.00	315000	30	76/04/24	87/12/21
00403	PH	LAB	SU	WATER		141	7.185400	.1996700	.4468400	8.0	4.2	74/02/14	87/12/21
00410	T ALK	CACO3	MG/L	WATER		140	41.12200	229.5500	15.15100	82	6	74/02/14	87/12/21
00415	PHEN-PH-	LF IN ALK	MG/L	WATER		1	36.00000			36	36	74/07/12	74/07/12
00480	SALINITY		PPTH	WATER		817	10.65000	34.08500	5.838200	25.0	.0	74/08/02	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		1	7.800000			8	8	81/08/07	81/08/07
					J	1	22.00000			22	22	78/04/24	78/04/24
					TOT	2	14.90000	100.8200	10.04100	22	8	78/04/24	81/08/07
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		1	80.00000			80.000	80.000	75/02/25	75/02/25
00610	NH3+NH4-	N TOTAL	MG/L	WATER		93	.2080600	.0944730	.3073700	2.500	.030	75/08/06	87/12/21
					K	25	.0496000	.0001790	.0133800	.100	.020	75/02/24	87/09/28
					TOT	118	.1744900	.0785520	.2802700	2.500	.020	75/02/24	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	92	.0050155	.0002049	.0143170	.105	.000006	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	92	.0060983	.0003030	.0174080	.129	.000007	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		108	.6799000	.3528700	.5940300	5.400	.060	75/02/24	87/12/21
					K	3	.0833330	.0008333	.0288680	.100	.050	76/12/15	80/07/21
					TOT	111	.6637800	.3527000	.5938900	5.400	.050	75/02/24	87/12/21
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		1	2151.000			2151.00	2151.00	75/02/25	75/02/25
00630	NO2&NO3	N-TOTAL	MG/L	WATER		128	.1471100	.0366040	.1913200	1.91	.01	74/02/14	87/12/21
					K	1	.0200000			.02	.02	76/06/07	76/06/07
					TOT	129	.1461200	.0364430	.1909000	1.91	.01	74/02/14	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		7	.1500000	.1014000	.31E4300	.87	.00	74/02/14	74/10/18

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COOPER RVR AB SHIPYARD CK AT BUOY 49
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030810
SANTEE COOPER MARINE DIST
21SC60WQ 03050201003 0001.980 ON
0000 FEET DEPTH

'TYPA/AMBNT/STRLAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00660	ORTHOPO4	PO4	MG/L	WATER	K	4	.0500000	.0000000	.0000000	.06	.06	75/02/24	75/04/29
00660	ORTHOPO4	PO4	MG/L	WATER	TOT	11	.1172700	.0629020	.2508000	.87	.00	74/02/14	75/04/29
00665	PHOS-TOT		MG/L P	WATER		81	.0958020	.0066045	.0812680	.460	.020	75/11/07	87/12/21
					K	35	.0560000	.0014777	.0384410	.200	.020	75/03/17	87/11/23
					TOT	116	.0837930	.0053680	.0732670	.460	.020	75/03/17	87/12/21
00680	T ORG C	C	MG/L	WATER		43	5.114000	7.338400	2.709000	13.9	1.3	76/01/23	87/10/08
					K	1	1.000000			1.0	1.0	81/10/28	81/10/28
					TOT	44	5.020500	7.552400	2.748200	13.9	1.0	76/01/23	87/10/08
00900	TOT HARD	CACO3	MG/L	WATER		3	922.6700	570340.0	755.2100	1500	68	79/01/30	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		1	110.0000			110.0	110.0	86/05/12	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		13	119.5000	65428.00	255.7900	959.0	4.4	75/02/24	76/06/07
00927	MGNSIUM	MG,TOT	MG/L	WATER		1	360.0000			360.0	360.0	86/05/12	86/05/12
01025	CADMIUM	CD,DISS	UG/L	WATER		1	10.00000			10	10	77/08/25	77/08/25
					K	19	15.79000	436.8400	20.90100	100	10	74/02/14	77/04/29
					TOT	20	15.50000	415.5300	20.38530	100	10	74/02/14	77/08/25
01027	CADMIUM	CD,TOT	UG/L	WATER		2	10.00000	.0000000	.0000000	10	10	78/04/24	78/07/21
					K	28	10.00000	.0000000	.0000000	10	10	78/10/13	87/10/08
					TOT	30	10.00000	.0000000	.0000000	10	10	78/04/24	87/10/08
01028	CD MLD	DRY WGT	MG/KG-CD	WATER	K	1	.5000000			.50	.50	75/02/25	75/02/25
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		1	27.00000			27.00	27.00	75/02/25	75/02/25
01030	CHROMIUM	CR,DISS	UG/L	WATER		2	240.0000	9800.000	98.99500	310	170	76/02/10	76/03/25
					K	18	52.77800	138.8900	11.78500	100	50	74/02/14	77/08/25
					TOT	20	71.50000	3960.800	62.93500	310	50	74/02/14	77/08/25
01034	CHROMIUM	CR,TOT	UG/L	WATER		1	1400.000			1400	1400	81/01/19	81/01/19
					K	29	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/08
					TOT	30	95.00000	60750.00	246.4800	1400	50	78/04/24	87/10/08
01040	COPPER	CU,DISS	UG/L	WATER		1	100.0000			100	100	74/07/12	74/07/12
					K	24	97.91700	104.1700	10.20700	100	50	74/02/14	77/08/25
					TOT	25	98.00000	100.0000	10.00000	100	50	74/02/14	77/08/25
01042	COPPER	CU,TOT	UG/L	WATER		2	80.00000	800.0000	28.28400	100	60	79/07/27	86/06/12
					K	34	61.76500	463.4600	21.52800	100	50	78/04/24	87/10/08
					TOT	36	62.77800	477.7800	21.85800	100	50	78/04/24	87/10/08
01043	COPPER	SEDMG/KG	DRY WGT	WATER		1	24.50000			24.50	24.50	75/02/25	75/02/25
01045	IRON	FE,TOT	UG/L	WATER		36	333.3300	40349.00	200.8700	900	120	78/04/24	87/10/08
01046	IRON	FE,DISS	UG/L	WATER		23	388.1700	110690.0	332.7000	1500	100	74/05/21	77/08/25
					K	2	100.0000	.0000000	.0000000	100	100	74/02/14	74/07/29
					TOT	25	365.1200	107830.0	328.3800	1500	100	74/02/14	77/08/25
01049	LEAD	PB,DISS	UG/L	WATER		3	56.66700	133.3400	11.54700	70	50	74/07/29	74/10/18
					K	22	56.81800	1022.700	31.98000	200	50	74/02/14	77/08/25

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COOPER RVR AB SHIPYARD CK AT BUOY 49
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030810
SANTEE COOPER MARINE DIST
21SC60WQ 03050201003 0001.960 ON
0000 FEET DEPTH

/TYPA/APBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01049	LEAD	PB.DISS	UG/L	WATER	TOT	25	56.80000	906.0000	30.10000	200	50	74/02/14	77/08/25
01051	LEAD	PB.TOT	UG/L	WATER		14	119.2900	1991.800	44.62900	180	50	78/04/24	83/07/06
					K	16	50.00000	.0000000	.0000000	50	50	79/01/30	87/10/08
					TOT	30	82.33300	2128.900	46.14000	180	50	78/04/24	87/10/08
01052	LEAD	SEDMG/KG	DRY WGT	WATER		1	34.50000			34.50	34.50	75/02/25	75/02/25
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	442.5000			442.50	442.50	75/02/25	75/02/25
01055	MANGNESE	MN	UG/L	WATER		4	52.50000	25.00000	5.000000	60.0	50.0	79/01/30	87/07/06
					K	32	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/08
					TOT	36	50.27800	2.778600	1.666900	60.0	50.0	78/04/24	87/10/08
01056	MANGNESE	MN.DISS	UG/L	WATER		3	165.0000	31675.00	177.9800	370.0	50.0	75/02/24	75/10/20
					K	15	50.00000	.0000000	.0000000	50.0	50.0	75/03/17	77/08/25
					TOT	18	69.16700	5671.300	75.30800	370.0	50.0	75/02/24	77/08/25
01065	NICKEL	NI.DISS	UG/L	WATER	K	18	100.0000	.0000000	.0000000	100	100	75/02/24	77/08/25
01067	NICKEL	NI.TOTAL	UG/L	WATER		8	80.00000	628.5700	25.07100	140	60	81/01/19	83/07/06
					K	28	66.07200	565.4800	23.78000	100	50	78/04/24	87/10/08
					TOT	36	69.16700	596.4300	24.42200	140	50	78/04/24	87/10/08
01068	NICKEL	SEDMG/KG	DRY WGT	WATER		1	11.00000			11.00	11.00	75/02/25	75/02/25
01090	ZINC	ZN.DISS	UG/L	WATER		1	120.0000			120	120	76/10/26	76/10/26
					K	17	100.0000	.0000000	.0000000	100	100	75/02/24	77/08/25
					TOT	18	101.1100	22.22800	4.714700	120	100	75/02/24	77/08/25
01092	ZINC	ZN.TOT	UG/L	WATER		17	238.8200	222470.0	471.6700	2000	50	78/07/21	87/07/0
					K	19	57.89500	350.8600	18.73200	100	50	78/04/24	87/10/08
					TOT	36	143.3300	110280.0	332.0800	2000	50	78/04/24	87/10/08
01093	ZINC	SEDMG/KG	DRY WGT	WATER		1	70.00000			70.00	70.00	75/02/25	75/02/25
31615	FEC COLI	MPNECMED	/100ML	WATER		1	11.00000			11	11	82/03/19	82/03/19
31616	FEC COLI	MFM-FCBR	/100ML	WATER		92	53.44600	3019.400	54.94900	380	5	74/02/14	87/12/21
					J	44	54.15900	5818.100	76.27700	480	3	76/09/09	87/09/28
					K	2	41.00000	3042.000	55.15400	80	2	80/07/21	85/07/09
					L	2	520.0000	156800.0	395.9800	800	240	75/06/03	85/06/14
					TOT	140	60.15700	8015.500	89.52900	800	2	74/02/14	87/12/21
32730	PHENOLS	TOTAL	UG/L	WATER		1	2.200000			2	2	75/04/29	75/04/29
39301	P,P'EDT	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39306	O,P' DDT	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39343	GLHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25

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COOPER RVR AB SHIPYARD CK AT BUOY 49
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030810
SANTEE COOPER MARINE DIST
21SC60WQ 03050201003 0001.980 ON
0000 FEET DEPTH

/TYPE/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39399	ETHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39531	MALATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39541	PARATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39571	DIAZINON	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39581	GUTHION	MUD DRY	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39783	LINDANE	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39787	TRITHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
46570	CAL HARD	CA MG	MG/L	WATER	$	1	1757.200			1757	1757	86/05/12	86/05/12
70320	MOISTURE	CONTENT	PERCENT	WATER		1	77.80000			78	78	75/02/25	75/02/25
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	1.760000			1.8	1.8	75/02/25	75/02/25
70507	PHOS-T	ORTHO	MG/L P	WATER		6	.0300000	.0001200	.0109550	.050	.020	75/11/07	79/07/27
					K	4	.0200000	.0000000	.0000000	.020	.020	75/06/03	76/06/07
					TOT	10	.0260000	.0000933	.0096609	.050	.020	75/06/03	79/07/27
71900	MERCURY	HG,TOTAL	UG/L	WATER		31	.6193500	.2975400	.5454700	2.5	.02	74/02/14	85/07/09
					K	27	.3000000	.0276920	.1664100	.8	.2	75/11/07	87/10/08
					TOT	58	.4172400	.1814100	.4259300	2.5	.02	74/02/14	87/10/08
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		1	.4000000			.4	.4	75/02/25	75/02/25
74041	WQI	SAMPLE	UPDATED	WATER		199	868340.0	37368000	6112.900	880419	860529	84/08/06	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.4800000			.48	.48	75/02/25	75/02/25
82048	BOT DPTH	OF SMPL	METERS	WATER		861	5.034200	13.91800	3.730630	14.00	.30	74/05/21	87/12/21

/TYPA/AMBNT/ESTURY/SOLIDS/BIO

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COOPER RIVER ABOVE SHIPYARD CREEK AT BUOY #49
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030810
SANTEE COOPER MARINE DIST
21SC60WQ HQ 03050201033 0002.900 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	MSAMPLOC	% FROM	RT BANK	WATER		451	50.00500	13.94500	3.734200	95.0	7.0	74/02/14	87/12/21
00010	WATER	TEMP	CENT	WATER		1132	20.07400	50.68200	7.119100	33.0	5.0	74/05/21	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	1132	68.12400	164.9600	12.84400	91.4	41.0	74/05/21	87/12/21
00020	AIR	TEMP	CENT	WATER		208	20.57700	50.62500	7.115100	41.0	5.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		18	22.33300	13.64800	3.694300	29.0	20.0	81/02/17	81/11/05
00036	WIND	DIR.FROM	NORTH=0	WATER		10	85.60000	4683.600	68.43700	225	1	79/05/02	80/02/29
00041	WEATHER	WMO CODE	4501	WATER		226	2.031000	25.14100	5.014100	22	0	80/01/15	87/12/21
00047	TOT PART	PRESSURE	MM HG	WATER		8	2000.000	.0000000	.0000000	2000.0	2000.0	81/03/10	81/03/10
00067	TIDE	STAGE	CODE	WATER		315	2999.700	1002100	1001.100	4300	2000	79/05/02	87/12/21
00076	TURB	TRBIDMTR	HACH FTU	WATER		181	8.903500	219.1200	14.80300	140.0	.3	74/02/14	87/12/21
00078	TRANSP	SECCHI	METERS	WATER		21	1.238600	.1017600	.3189900	2.10	.70	79/05/02	82/08/12
00080	COLOR	PT-CO	UNITS	WATER		17	28.65300	108.0600	10.39500	40	4	74/02/14	78/04/24
00116	INTNSVE	SURVEY	IDENT	WATER		147	794510.0	.0000000	.0000000	794512	794512	79/05/02	80/11/06
00300	DO		MG/L	WATER		1143	7.104300	4.629800	2.151700	16.6	2.9	74/05/21	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	1132	74.76000	196.1000	14.00400	146.9	36.7	74/05/21	87/12/21
00310	BOD	5 DAY	MG/L	WATER		138	1.497800	.4231600	.6505000	4.6	.5	74/02/14	87/12/21
					K	7	1.071400	.2023800	.4498700	2.0	.5	76/02/26	84/12/14
					L	1	8.200000			8.2	8.2	75/10/07	75/10/07
					TOT	146	1.523300	.7260900	.8521100	8.2	.5	74/02/14	87/12/21
00339	COD MUD	DRY WGT	MG/KG	WATER		11	66691.00	1461E+06	38230.00	150000	6500	75/02/25	86/12/04
00340	COD	HI LEVEL	MG/L	WATER		6	81.83300	1734.200	41.64300	140	19	75/10/07	76/03/25
00400	PH		SU	WATER		148	7.693500	.1860900	.4313800	9.00	6.50	74/05/21	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		1087	23829.00	1269E+05	11265.00	215000	27	77/04/28	87/12/21
00403	PH	LAB	SU	WATER		185	7.428000	.1461700	.3823200	8.1	5.4	74/02/14	87/12/21
00410	T ALK	CACO3	MG/L	WATER		185	58.09700	520.8400	22.82200	160	10	74/02/14	87/12/21
00415	PHEN-PH-	LF IN ALK	MG/L	WATER		1	48.00000			48	48	74/07/12	74/07/12
00480	SALINITY		PPTH	WATER		1094	16.51100	42.22200	6.497800	30.0	1.0	74/08/02	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		43	33.22300	4292.500	65.51700	430	4	76/04/24	82/08/12
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		11	1070.000	4117800	2029.300	6800.000	40.000	75/02/25	87/12/21
					K	1	5.000000			5.000	5.000	86/02/14	86/02/14
					TOT	12	981.2500	3838000	1959.100	6800.000	5.000	75/02/25	87/12/21
00 10	NH3+NH4-	N TOTAL	MG/L	WATER		121	.1921500	.0189310	.1375900	.700	.040	75/11/07	87/12/21
					K	31	.0664510	.0068104	.0825250	.500	.020	74/11/27	87/08/28
					TOT	152	.1665100	.0189800	.1377700	.700	.020	74/11/27	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	129	.0050045	.0000688	.0082963	.070	.00007	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	129	.0060850	.0001017	.0100870	.085	.00008	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		124	.6234600	.1491600	.3862200	2.060	.050	74/11/27	87/12/21
					K	8	.1062500	.0017411	.0417260	.200	.050	75/04/29	80/07/21
					TOT	132	.5921200	.1554900	.3943300	2.060	.050	74/11/27	87/12/21

/TYPA/AMBNT/LSTURY/SDL1DS/D1D

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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
0062	ORGAN. N MUD D WT		MG/KG-N	WATER		12	825.7800	1074900	1036.800	2307.00	5.00	75/02/25	85/02/25
					K	1	2.500000			2.50	2.50	83/01/25	83/01/25
					TOT	13	762.4500	1037400	1018.500	2307.00	2.50	75/02/25	85/02/25
00 27	KJELDL N TOT MU D		MG/KG	WATER		3	1677.700	291600.0	540.0000	2300.000	1333.000	86/02/14	87/12/21
00630	NO2&NO3 N-TOTAL		MG/L	WATER		161	.1339100	.0290320	.1703900	1.89	.02	74/02/14	87/12/21
					K	1	.0200000			.02	.02	84/12/14	84/12/14
					TOT	162	.1332100	.0289320	.1700900	1.89	.02	74/02/14	87/12/21
00660	ORTHOPO4 PO4		MG/L	WATER		9	.0900000	.0029250	.0540830	.18	.00	74/02/14	75/02/24
					K	3	.0600000	.0000000	.0000000	.06	.06	75/03/17	75/04/29
					TOT	12	.0825000	.0023114	.0480770	.18	.00	74/02/14	75/04/29
00665	PHOS-TOT		MG/L P	WATER		118	.0900000	.0042204	.0649650	.340	.020	75/11/07	87/12/21
					K	33	.0657570	.0032503	.0570110	.300	.020	74/11/27	87/11/23
					TOT	151	.0847020	.0040864	.0639250	.340	.020	74/11/27	87/12/21
00668	PHOS MUD DRY WGT		MG/KG-P	WATER		15	769.8900	476040.0	689.9600	2040.0	4.0	77/02/10	87/12/21
00680	T ORG C C		MG/L	WATER		80	4.621200	16.43500	4.054000	36.0	1.0	76/01/23	87/10/08
					K	1	5.000000			5.0	5.0	78/11/06	78/11/06
					TOT	81	4.625900	16.23100	4.028800	36.0	1.0	76/01/23	87/10/08
00900	TOT HARD CACO3		MG/L	WATER		3	2000.000	760000.0	871.7800	2600	1000	79/01/30	87/05/14
00916	CALCIUM CA-TOT		MG/L	WATER		1	170.0000			170.0	170.0	86/05/12	86/05/12
00925	MGNSIUM MG.DISS		MG/L	WATER		11	134.0100	2093.500	45.75500	187.5	67.0	75/02/24	76/03/25
00927	MGNSIUM MG.TOT		MG/L	WATER		1	540.0000			540.0	540.0	86/05/12	86/05/12
00940	CHLORIDE TOTAL		MG/L	WATER		35	7980.000	20486000	4526.200	20000	1500	79/05/02	82/05/06
01000	ARSENIC AS.DISS		UG/L	WATER	K	1	5.000000			5	5	74/11/27	74/11/27
01025	CADMIUM CD.DISS		UG/L	WATER		2	10.00000	.0000000	.0000000	10	10	76/06/03	77/08/25
					K	17	16.47100	486.7700	22.06300	100	10	74/02/14	77/04/28
					TOT	19	15.79000	436.8400	20.90100	100	10	74/02/14	77/08/25
01027	CADMIUM CD.TOT		UG/L	WATER		2	21.50000	144.5000	12.02100	30	13	78/04/24	78/07/21
					K	31	10.00000	.0000000	.0000000	10	10	78/10/13	87/10/08
					TOT	33	10.69700	12.28000	3.504300	30	10	78/04/24	87/10/08
01028	CD MUD DRY WGT		MG/KG-CD	WATER		2	1.050000	.0050020	.0707250	1.10	1.00	78/05/12	80/03/25
					K	14	.9557200	.0179190	.1338600	1.00	.50	75/02/25	87/12/21
					TOT	16	.9675000	.0169000	.1300000	1.10	.50	75/02/25	87/12/21
01029	CHROMIUM SEDMG/KG	DRY WGT		WATER		15	27.95300	105.8900	10.29000	50.00	15.00	75/02/25	87/12/21
					K	1	5.000000			5.00	5.00	80/03/25	80/03/25
					TOT	16	26.51900	131.7600	11.47900	50.00	5.00	75/02/25	87/12/21
01030	CHROMIUM CR.DISS		UG/L	WATER	K	19	52.63200	131.5800	11.47100	100	50	74/02/14	77/08/25
01034	CHROMIUM CR.TOT		UG/L	WATER		1	70.00000			70	70	79/10/30	79/10/30
					K	66	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/08
					TOT	67	50.29900	5.972500	2.443900	70	50	78/04/24	87/10/08

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/TYPE/AMENT/LSTURY/SOLIDS/L10

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01040	COPPER	CU,DISS	UG/L	WATER		2	130.0000	1800.000	42.42700	160	100	74/07/12	74/11/27
					K	23	97.82600	108.7000	10.42600	100	50	74/02/14	77/08/25
					TOT	25	100.4000	254.0000	15.93800	160	50	74/02/14	77/08/25
01042	COPPER	CU,TOT	UG/L	WATER		9	75.55600	602.7800	24.55200	120	50	79/10/30	86/06/12
					K	64	74.21900	634.3000	25.18500	100	50	78/04/24	87/10/08
					TOT	73	74.38400	622.1900	24.94400	120	50	78/04/24	87/10/08
01043	COPPER	SEDMG/KG	DRY WGT	WATER		13	16.43900	25.93000	5.092100	26.00	9.00	75/02/25	87/12/21
					K	3	6.666700	8.333400	2.886800	10.00	5.00	80/03/25	86/02/14
					TOT	16	14.60600	37.37100	6.113200	26.00	5.00	75/02/25	87/12/21
01045	IRON	FE,TOT	UG/L	WATER		73	765.8900	5358300	2314.800	20000	110	78/04/24	87/10/08
01046	IRON	FE,DISS	UG/L	WATER		23	397.9100	129400.0	359.7200	1700	156	74/05/21	77/08/25
					K	2	100.0000	.0000000	.0000000	100	100	74/02/14	77/02/10
					TOT	25	374.0800	125420.0	354.1500	1700	100	74/02/14	77/08/25
01049	LEAD	PB,DISS	UG/L	WATER		12	131.6700	5324.300	72.96800	270	50	74/07/12	77/08/25
					K	13	61.53900	1730.800	41.60300	200	50	74/02/14	77/02/10
					TOT	25	95.20000	4584.300	67.70800	270	50	74/02/14	77/0 /25
01051	LEAD	PB,TOT	UG/L	WATER		58	224.1400	17779.00	133.3400	600	50	78/04/24	84/04/27
					K	9	50.00000	.0000000	.0000000	50	50	80/05/28	87/10/08
					TOT	67	200.7500	18934.00	137.6000	600	50	78/04/24	87/10/08
01052	LEAD	SEDMG/KG	DRY WGT	WATER		14	29.57200	109.0000	10.44000	46.00	11.00	75/02/25	87/12/21
					K	2	5.000000	.0000000	.0000000	5.00	5.00	80/03/25	86/02/14
					TOT	16	26.50000	164.9000	12.84100	46.00	5.00	75/02/25	87/12/21
01053	MN AVD	DRY WGT	MG/KG-MN	WATER		2	545.0000	396050.0	629.3300	990.00	100.00	75/02/25	86/02/14
01055	MANGNESE	MN	UG/L	WATER		7	60.00000	66.66700	8.165000	70.0	50.0	80/07/21	87/04/13
					K	32	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/08
					TOT	39	51.79500	25.64300	5.063900	70.0	50.0	78/04/24	87/10/08
01056	MANGNESE	MN,DISS	UG/L	WATER		4	80.00000	1666.700	40.82500	140.0	50.0	75/02/24	75/04/29
					K	13	50.00000	.0000000	.0000000	50.0	50.0	75/06/03	77/08/25
					TOT	17	57.05900	484.5600	22.01300	140.0	50.0	75/02/24	77/08/25
01065	NICKEL	NI,DISS	UG/L	WATER		2	100.0000	.0000000	.0000000	100	100	76/08/11	76/10/26
					K	15	100.0000	.0000000	.0000000	100	100	75/02/24	77/08/25
					TOT	17	100.0000	.0000000	.0000000	100	100	75/02/24	77/08/25
01067	NICKEL	NI,TOTAL	UG/L	WATER		17	124.1200	4325.700	65.77000	280	50	78/07/21	85/10/22
					K	22	68.18200	606.0600	24.61800	100	50	78/04/24	87/10/08
					TOT	39	92.56400	2945.900	54.27600	280	50	78/04/24	87/10/08
01068	NICKEL	SEDMG/KG	DRY WGT	WATER		11	12.90900	15.64100	3.954900	20.00	6.50	75/02/25	87/12/21
					K	2	7.500000	12.50000	3.535500	10.00	5.00	80/03/25	85/02/25
					TOT	13	12.07700	18.20200	4.266400	20.00	5.00	75/02/25	87/12/21
01090	ZINC	ZN,DISS	UG/L	WATER		1	100.0000			100	100	75/02/24	75/02/24

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PARAMETER				MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01090	ZINC	ZN,DISS	UG/L	WATER	K	17	100.0000	.0000000	.0000000	100	100	74/11/27	77/08/25
01090	ZINC	ZN,DISS	UG/L	WATER	TOT	18	100.0000	.0000000	.0000000	100	100	74/11/27	77/08/25
01092	ZINC	ZN,TOT	UG/L	WATER		46	167.8300	26533.00	162.8900	900	50	78/07/21	87/10/08
					K	27	72.22200	641.0300	25.31900	100	50	78/04/24	87/07/06
					TOT	73	132.4700	18974.00	137.7500	900	50	78/04/24	87/10/08
01093	ZINC	SEDMG/KG	DRY WGT	WATER		14	62.92900	411.7700	20.29200	80.00	11.00	75/02/25	87/12/21
					K	1	10.00000			10.00	10.00	80/03/25	80/03/25
					TOT	15	50.06700	505.2100	22.47700	80.00	10.00	75/02/25	87/12/21
31501	TOT COLI	MFIMENDU	/100ML	WATER		14	1190.000	915050.0	956.5800	3500	210	79/05/02	82/08/12
					J	8	1787.500	278390.0	527.6300	2700	1200	79/05/03	82/05/06
					TOT	22	1407.300	745800.0	863.6000	3500	210	79/05/02	82/08/12
31506	TOT COLI	MPN CONF	TUBECODE	WATER		1	700.0000			700	700	82/08/12	82/08/12
31616	FEC COLI	MFM-FCBR	/100ML	WATER		115	106.7400	9226.800	96.05600	580	5	74/02/14	87/12/21
					J	41	128.1500	72233.00	268.7600	1700	2	76/09/09	87/11/23
					L	5	248.0000	98520.00	313.8800	800	60	74/08/02	79/07/27
					TOT	161	116.5800	27739.00	166.5500	1700	2	74/02/14	87/12/21
31673	FECSTREP	MFKFAGAR	/100ML	WATER		20	122.0500	9978.400	99.89200	400	11	79/05/02	82/08/12
					J	3	11.33300	65.33400	8.082900	20	4	79/08/02	80/02/15
					TOT	23	107.6100	10077.00	100.3900	400	4	79/05/02	82/08/12
32730	PHENOLS	TOTAL	UG/L	WATER		1	.0000000			0	0	75/04/29	75/04/29
34257	BETA BHC	SEDUG/KG	DRY WGT	WATER	K	3	2.000000	.0000000	.0000000	2.000	2.000	86/02/14	87/12/21
34354	ENDSULSF	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34359	BENDDSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34364	ALNDDSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34369	ENDRINAL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
39076	ALPHABHC	SEDUG/KG	DRY WGT	WATER	K	4	2.250000	.2500000	.5000000	3.000	2.000	79/05/02	87/12/21
39300	P,P'LDT		TOT UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39301	P,P'LDT	SEDUG/KG	DRY WGT	WATER	K	16	2.146700	1.778400	1.333600	5.00	.10	75/02/25	87/12/21
39305	D,P' DDT	WHL SMPL	UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39306	D,P' DDT	MUD DRY	UG/KG	WATER	K	15	2.146700	1.778400	1.333600	5.00	.10	75/02/25	87/12/21
39310	P,P'DDD		TOT UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER		1	2.670000			2.67	2.67	75/02/25	75/02/25
					K	14	2.292900	1.570000	1.253000	5.00	.10	77/02/10	87/12/21
					TOT	15	2.318000	1.467300	1.211300	5.00	.10	75/02/25	87/12/21
39315	D,P' DDD	WHL SMPL	UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39316	D,P' DDD	MUD DRY	UG/KG	WATER	K	15	2.146700	1.778400	1.333600	5.00	.10	75/02/25	87/12/21
39320	P,P'DDE		TOT UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER		4	5.895000	58.72600	7.663300	17.20	.30	75/02/25	86/12/04
					K	11	2.372700	2.008200	1.417100	5.00	.10	77/02/10	87/12/21

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	PARAMETER			MEDIUM	WHK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER	TOT	15	3.312000	16.61800	4.076500	17.20	.10	75/02/25	87/12/21
39327	O,P'DDE	WHL SMPL	UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39328	O,P'DDE	MUD	UG/KG	WATER	K	4	2.750000	2.250000	1.500000	5.00	2.00	79/05/02	87/12/21
39330	ALDRIN		TOT UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	15	1.880000	.6431500	.8019700	3.00	.10	75/02/25	87/12/21
39337	ALPHABHC		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39338	BETA BHC		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39343	GEHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39351	CDANEDRY	TECHEMET	PUDUG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	86/12/04	87/12/21
39380	DIELDRIN		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	15	2.813300	8.949800	2.991600	10.00	.10	75/02/25	87/12/21
39390	ENDRIN		TOT UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	14	2.871400	9.583800	3.095800	10.00	.10	75/02/25	87/12/21
39398	ETHION	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39399	ETHION	MUD	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	75/02/25	87/12/21
39400	TEXAPHEN		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	15	8.146700	289.1800	17.00500	50.00	.10	75/02/25	87/12/21
39410	HEPTCHLR		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	15	1.880000	.6431500	.8019700	3.00	.10	75/02/25	87/12/21
39420	HPCHEREP		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	15	2.813300	8.949800	2.991600	10.00	.10	75/02/25	87/12/21
39480	MTHXYCLR	WHL SMPL	UG/L	WATER	K	1	.0500000			.050	.050	82/05/06	82/05/06
39481	MTHXYCLR	MUD DRY	UG/KG	WATER	K	3	2.000000	.0000000	.0000000	2.00	2.00	86/02/14	87/12/21
39491	PCB-1221	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39495	PCB-1232	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39499	PCB-1242	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39503	PCB-124	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39507	PCB-1254	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39511	PCB-1260	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39514	PCB-1016	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39516	PCBS	WHL SMPL	UG/L	WATER	K	6	.5000000	.0000000	.0000000	.500	.500	79/05/02	82/05/06
39519	PCBS	MUD	UG/KG	WATER		1	24.60000			24.60	24.60	82/05/07	82/05/07
					K	12	24.58300	1243.000	35.25600	100.00	5.00	77/02/10	86/12/04
					TOT	13	24.58500	1139.400	33.75500	100.00	5.00	77/02/10	86/12/04
39530	MALATHN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39531	MALATHN	MUD	UG/KG	WATER	K	12	11.16700	330.3300	18.17500	50.00	1.00	75/02/25	87/12/21
39540	PARATHN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39541	PARATHN	MUD	UG/KG	WATER	K	12	7.833300	108.5200	10.41700	30.00	1.00	75/02/25	87/12/21
39570	DIAZINON	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06

/TYPA/AMENT/ESTUARY/SOLIDS/B10

MD-045
32 50 30.0 079 55 50.0 3
COOPER RIVER ABOVE SHIPYARD CREEK AT BUOY #49
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030810
SANTEE COOPER MARINE DIST
21SC60WQ HQ 03050201033 0002.900 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39571	DIAZINON	MUD	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	75/02/25	87/12/21
39580	GUTHION	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39581	GUTHION	MUD DRY	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	75/02/25	87/12/21
39610	PHOSERIN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39701	HCB	SEDUG/KG	DRY WGT	WATER	K	1	4.000000			4.00	4.00	87/12/21	87/12/21
39756	MIREX	EOT MAT	UG/KG	WATER	K	2	3.000000	2.000000	1.414200	4.00	2.00	86/12/04	87/12/21
39782	LINDANE	WHL SMPL	UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39783	LINDANE	MUD DRY	UG/KG	WATER	K	15	2.146700	1.778400	1.333600	5.00	.10	75/02/25	87/12/21
39786	TRITHION	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39787	TRITHION	MUD	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	75/02/25	87/12/21
46570	CAL HARD	CA MG	MG/L	WATER	$	1	2648.200			2648	2648	86/05/12	86/05/12
70310	PH	SU	EOT MUD	WATER		5	7.180000	.2420700	.4920000	7.9	6.6	82/03/19	87/12/21
70320	MOISTURE	CONTENT	PERCENT	WATER		12	63.55000	231.7400	15.22300	76	24	75/02/25	87/12/21
70322	RESIDUE	TOT VOL	PERCENT	WATER		13	11.02800	30.38700	5.512500	22.0	2.8	75/02/25	87/12/21
70507	PHOS-T	ORTHO	MG/L P	WATER		7	.0371430	.0001571	.0125360	.060	.020	75/06/03	79/07/27
					K	2	.0200000	.0000000	.0000000	.020	.020	75/08/06	76/03/25
					TOT	9	.0333330	.0001750	.0132290	.060	.020	75/06/03	79/07/27
71900	MERCURY	HG,TOTAL	UG/L	WATER		63	.7634900	1.525100	1.235000	8.5	.1	74/02/14	85/10/22
					K	32	.2937500	.0257660	.1605200	.8	.2	75/10/07	87/10/08
					TOT	95	.6052600	1.064300	1.031600	8.5	.1	74/02/14	87/10/08
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		3	9.920000	273.0400	16.52400	29.0	.4	75/02/25	82/03/19
					K	13	.2269200	.0006731	.0259440	.3	.2	77/02/10	87/12/21
					TOT	16	2.044400	51.67300	7.188400	29.0	.2	75/02/25	87/12/21
74041	WQF	SAMPLE	UPDATED	WATER		223	867330.0	37333000	6110.100	880804	860529	84/08/06	87/12/21
78453	PCB-1262	SED DRY	WT UG/KG	WATER	K	1	10.00000			10.000	10.000	87/12/21	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.3400000			.34	.34	75/02/25	75/02/25
82028	RATIO	FEC COL	FEC STRP	WATER	$	23	1.562700	2.193200	1.480900	6	.2	79/05/02	82/08/12
82048	EQT DPTH	OF SMPL	METERS	WATER		1122	5.150700	13.28500	3.644900	14.00	.10	74/05/21	87/12/21

/TYPA/AMBNT/STREAM

MD-046
32 48 20.0 079 55 00.0 3
COOPER RVR UNDER GRACE MEM BRIDGE
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
EDISTO COMBAHEE MARINE
21SC60WQ HQ 03050201028 0001.620 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		454	50.00000	.0000000	.0000000	50.0	50.0	74/02/14	87/12/21
0001	WATER	TEMP	CENT	WATER		1251	20.26600	45.87200	6.772900	32.0	6.5	74/05/21	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	1251	68.46700	149.7100	12.23600	89.6	43.7	74/05/21	87/12/21
00020	AIR	TEMP	CENT	WATER		214	21.00200	51.85900	7.201300	41.0	4.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		12	23.16700	16.88000	4.108500	29.0	20.0	81/05/19	81/11/05
00036	WIND	DIR.FROM	NORTH-0	WATER		10	85.60000	4683.600	68.43700	225	1	79/05/02	80/02/29
00041	WEATHER	WMO CODE	4501	WATER		222	2.469500	32.56700	5.705900	22	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		375	2902.700	984860.0	992.4000	4300	2000	79/05/02	87/12/21
00076	TURB	TRBIDMTR	HACH FTU	WATER		179	8.395500	83.17100	9.119800	57.0	.4	74/02/14	87/12/21
					L	1	100.0000			100.0	100.0	79/10/30	79/10/30
					TOT	180	8.904400	129.3300	11.37200	100.0	.4	74/02/14	87/12/21
00078	TRANSP	SECCHI	METERS	WATER		20	1.200500	.0724430	.2691500	2.05	.80	79/05/02	82/08/12
00080	COLOR	PT-CO	UNITS	WATER		19	27.00000	64.63900	8.039800	40	7	74/02/14	78/04/24
0011	INTRSVE	SURVEY	ICENT	WATER		162	794510.0	.0000000	.0000000	794512	794512	79/05/02	80/11/06
00300	DO		MG/L	WATER		1262	7.177900	3.707000	1.925400	17.0	2.5	74/05/21	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	1250	76.76000	165.9000	12.88000	146.6	31.6	74/05/21	87/12/21
00310	BOD	5 DAY	MG/L	WATER		142	1.720800	.8294500	.9107400	6.6	.4	74/02/14	87/12/21
					K	3	1.333300	.3333400	.5773500	2.0	1.0	76/02/20	84/10/29
					L	2	8.075000	.0113370	.1064800	8.2	8.0	75/10/07	77/05/20
					TOT	147	1.799300	1.355700	1.164300	8.2	.4	74/02/14	87/12/21
00339	COD MUD	DRY WGT	MG/KG	WATER		1	80000.00			80000	80000	75/02/25	75/02/25
00340	COD	HI LEVEL	MG/L	WATER		6	190.0000	12920.00	113.6700	410	110	75/10/07	7 /03/25
00400	PH		SU	WATER		143	7.787300	.1406500	.3750400	9.10	6.50	74/05/21	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		1223	28945.00	72003000	8485.500	49500	3000	78/04/24	87/12/21
00403	PH	LAB	SU	WATER		184	7.615400	.1165100	.3413300	8.4	5.9	74/02/14	87/12/21
00410	T ALK	CACO3	MG/L	WATER		184	72.22000	499.9400	22.35900	178	17	74/02/14	87/12/21
00415	PHEN-PH-	LFIN ALK	MG/L	WATER		1	60.00000			60	60	74/07/12	74/07/12
00430	CO3 ALK	CACO3	MG/L	WATER		1	7.600000			8	8	81/05/19	81/05/19
00480	SALINITY		PPTH	WATER		1230	20.60600	30.24200	5.499300	35.0	.0	74/08/02	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		42	23.54500	585.6000	24.19900	130	1	79/05/02	82/08/12
					J	1	4.000000			4	4	78/04/24	78/04/24
					TOT	43	23.09100	580.5400	24.09500	130	1	78/04/24	82/08/12
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		1	770.0000			770.000	770.000	75/02/25	75/02/25
00610	NH3+NH4-	N TOTAL	MG/L	WATER		122	.2357300	.0439240	.2095800	1.200	.050	75/04/29	87/12/21
					K	25	.0496000	.0001790	.0133800	.100	.020	74/11/27	87/09/29
					TOT	147	.2040800	.0413560	.2033600	1.200	.020	74/11/27	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	127	.0077444	.0001960	.0140010	.098	.00008	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	127	.0094162	.0002898	.0170240	.119	.0001	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		131	.6755700	.2996900	.5474400	3.600	.050	74/11/27	87/12/21

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COOPER RVR UNDER GRACE MEM BRIDGE
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TYPE/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00625	TOT KJEL	N	MG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	80/01/15	80/07/21
00625	TOT KJEL	N	MG/L	WATER	TOT	136	.6544100	.3004000	.5480900	3.600	.050	74/11/27	87/12/21
00626	ORGAN. N MUD D WT		MG/KG-N	WATER		3	641.7000	1009800	1004.900	1800.00	3.40	75/02/25	81/05/14
					K	1	2.500000			2.50	2.50	82/05/07	82/05/07
					TOT	4	481.9000	775310.0	880.5200	1800.00	2.50	75/02/25	82/05/07
00630	NO2&NO3	N-TOTAL	MG/L	WATER		160	.1109400	.0076939	.0877150	.53	.02	74/02/14	87/12/21
					K	2	.0200000	.0000000	.0000000	.02	.02	75/08/06	84/12/14
					TOT	162	.1098100	.0076998	.0877480	.53	.02	74/02/14	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		12	.2033300	.0136060	.1166500	.39	.06	74/02/14	75/04/29
00665	PHOS-TOT		MG/L P	WATER		130	.1205400	.1597500	.3996900	4.600	.020	75/11/07	87/12/21
					K	21	.0761900	.0048448	.0696050	.300	.020	74/11/27	87/11/23
					TOT	151	.1143700	.1382700	.3718530	4.600	.020	74/11/27	87/12/21
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		3	1182.000	4134800	2033.400	3530.0	7.0	79/05/02	82/05/07
00680	T ORG C	C	MG/L	WATER		83	5.019500	11.71500	3.422700	21.6	1.7	74/11/27	87/10/08
00900	TOT HARD	CACO3	MG/L	WATER		3	2356.700	2190600	1480.100	3700	770	79/01/30	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		1	230.0000			230.0	230.0	86/05/12	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		13	303.1700	22533.00	150.1100	596.0	.4	75/02/24	76/06/07
00927	MGNSIUM	MG,TOT	MG/L	WATER		1	760.0000			760.0	760.0	86/05/12	86/05/12
00940	CHLORIDE	TOTAL	MG/L	WATER		103	9387.800	24440000	4943.700	22000	3	74/09/17	87/12/21
01000	ARSENIC	AS,DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/27	74/11/27
01025	CADMIUM	CD,DISS	UG/L	WATER		3	30.00000	400.0000	20.00000	50	10	74/02/14	77/08/25
					K	18	16.11100	460.4600	21.45800	100	10	74/04/19	77/04/28
					TOT	21	18.09500	456.1900	21.35900	100	10	74/02/14	77/08/25
01027	CADMIUM	CD,TOT	UG/L	WATER		4	32.50000	149.6700	12.23400	49	20	78/04/24	85/01/28
					K	31	10.00000	.0000000	.0000000	10	10	78/10/13	87/10/08
					TOT	35	12.57200	65.95800	8.121500	49	10	78/04/24	87/10/08
01028	CD MLD	DRY WGT	MG/KG-CD	WATER	K	4	.8750000	.0625000	.2500000	1.00	.50	75/02/25	82/05/07
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		4	19.12500	47.06300	6.860200	28.00	13.00	75/02/25	82/05/07
01030	CHROMIUM	CR,DISS	UG/L	WATER		1	60.00000			60	60	76/03/25	76/03/25
					K	20	55.00000	236.8400	15.39000	100	50	74/02/14	77/08/25
					TOT	21	55.23800	226.1900	15.04000	100	50	74/02/14	77/08/25
01034	CHROMIUM	CR,TOT	UG/L	WATER		1	250.0000			250	250	85/01/28	85/01/28
					K	68	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/08
					TOT	69	52.89900	579.7100	24.07700	250	50	78/04/24	87/10/08
01040	COPPER	CU,DISS	UG/L	WATER		1	150.0000			150	150	74/11/27	74/11/27
					K	26	96.15400	184.6200	13.58700	100	50	74/02/14	77/08/25
					TOT	27	98.14800	284.9000	16.87900	150	50	74/02/14	77/08/25
01042	COPPER	CU,TOT	UG/L	WATER		7	68.57200	580.9600	24.10300	100	50	79/07/27	82/05/06
					K	67	73.13400	630.9400	25.11900	100	50	78/04/24	87/10/08

MD-046
32 48 20.0 079 55 00.0 3
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/TYPE/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01042	COPPER	CU.TOT	UG/L	WATER	TOT	74	72.70300	620.0000	24.90000	100	50	78/04/24	87/10/08
01043	COPPER	SEDMG/KG	DRY WGT	WATER		4	8.375000	4.562500	2.136000	10.00	5.50	75/02/25	82/05/07
01045	IRON	FE.TOT	UG/L	WATER		74	581.0800	342240.0	585.0100	4000	130	78/04/24	87/10/08
01046	IRON	FE.DISS	UG/L	WATER		24	363.7900	148090.0	384.8300	2030	100	74/05/21	77/08/25
					K	3	100.0000	.0000000	.0000000	100	100	74/02/14	75/04/29
					TOT	27	334.4800	138140.0	371.6700	2030	100	74/02/14	77/08/25
01049	LEAD	PB.DISS	UG/L	WATER		14	167.5700	3910.300	62.53200	260	66	74/05/21	77/08/25
					K	13	73.07700	3173.100	56.33000	200	50	74/02/14	76/10/26
					TOT	27	122.0800	5734.600	75.72700	260	50	74/02/14	77/08/25
01051	LEAD	PB.TOT	UG/L	WATER		61	311.4800	21516.00	146.6800	710	60	78/04/24	85/01/28
					K	8	50.00000	.0000000	.0000000	50	50	86/02/14	87/10/08
					TOT	69	281.1600	26096.00	161.5400	710	50	78/04/24	87/10/08
01052	LEAD	SEDMG/KG	DRY WGT	WATER		4	23.50000	53.66700	7.325800	34.00	17.00	75/02/25	82/05/07
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	226.0000			226.00	226.00	75/02/25	75/02/25
01055	MANGNESE	MN	UG/L	WATER		11	74.54600	1447.300	38.04300	150.0	50.0	78/07/21	83/07/06
					K	29	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/08
					TOT	40	56.75000	494.3000	22.23300	150.0	50.0	78/04/24	87/10/08
01056	MANGNESE	MN.DISS	UG/L	WATER		3	200.0000	54900.00	234.3100	470.0	50.0	75/02/24	75/04/29
					K	15	50.00000	.0000000	.0000000	50.0	50.0	75/03/27	77/08/25
					TOT	18	75.00000	9767.700	98.83100	470.0	50.0	75/02/24	77/08/25
01065	NICKEL	NI.DISS	UG/L	WATER		11	120.9100	769.1000	27.73300	170	100	75/02/24	77/08/25
					K	7	100.0000	.0000000	.0000000	100	100	75/03/17	76/06/07
					TOT	18	112.7800	662.4200	23.71600	170	100	75/02/24	77/08/25
01067	NICKEL	NI.TOTAL	UG/L	WATER		22	153.6400	5786.200	76.06700	310	50	78/04/24	85/10/22
					K	18	66.66700	588.2400	24.25400	100	50	79/01/30	87/10/08
					TOT	40	114.5000	5292.100	72.74700	310	50	78/04/24	87/10/08
01068	NICKEL	SEDMG/KG	DRY WGT	WATER		1	15.00000			15.00	15.00	75/02/25	75/02/25
01090	ZINC	ZN.DISS	UG/L	WATER	K	19	100.0000	.0000000	.0000000	100	100	74/11/27	77/08/25
01092	ZINC	ZN.TOT	UG/L	WATER		53	134.9100	11622.00	107.8000	800	60	78/04/24	87/10/08
					K	21	69.04800	619.0500	24.88100	100	50	78/10/13	87/04/13
					TOT	74	116.2200	9341.700	96.65200	800	50	78/04/24	87/10/08
01093	ZINC	SEDMG/KG	DRY WGT	WATER		4	34.12500	72.39600	8.508600	41.50	23.00	75/02/25	82/05/07
31501	TOT COL	MFIMENDO	/100ML	WATER		17	882.3500	701380.0	837.4900	3400	60	79/05/02	82/08/12
					J	4	565.0000	230230.0	479.8300	1100	140	79/08/02	80/11/06
					L	1	1600.000			1600	1600	81/08/07	81/08/07
					TOT	22	857.2700	610330.0	781.2300	3400	60	79/05/02	82/08/12
31506	TOT COL	MPN CONF	TUBECODE	WATER		1	400.0000			400	400	82/08/12	82/08/12
3161	FEC COL	MFM-FCBR	/100ML	WATER		119	75.49600	10216.00	101.0800	860	1	74/02/14	87/12/21
					J	38	76.26300	17682.00	132.9800	740	4	76/09/09	87/09/29

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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
31616	FEC COLI MFM-FCBR	/100ML		WATER	L	3	326.6700	168930.0	411.0200	800	60	75/02/24	79/08/09
31616	FEC COLI MFM-FCBR	/100ML		WATER	TOT	160	80.38800	14988.00	122.4300	860	1	74/02/14	87/12/21
31673	FECSTREP MFKFAGAR	/100ML		WATER		18	135.2200	12900.00	113.5800	360	6	79/05/02	82/08/12
					J	4	12.00000	29.33300	5.416000	16	4	79/08/02	81/05/19
					K	1	2.000000			2	2	79/08/02	79/08/02
					TOT	23	108.0000	12765.00	112.9800	360	2	79/05/02	82/08/12
39076	ALPHABHC SEDUG/KG	DRY WGT		WATER	K	1	3.000000			3.000	3.000	79/05/02	79/05/02
39300	P.P'DDT	TOT UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39301	P.P'DDT SEDUG/KG	DRY WGT		WATER		1	1.930000			1.93	1.93	75/02/25	75/02/25
					K	3	3.000000	3.000000	1.732100	5.00	2.00	79/05/02	82/05/07
					TOT	4	2.732500	2.286200	1.512000	5.00	1.93	75/02/25	82/05/07
39305	O.P' DDT WHL SMPL	UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39306	O.P' DDT MUD DRY	UG/KG		WATER	K	4	2.275000	4.102500	2.025500	5.00	.10	75/02/25	82/05/07
39310	P.P'DDD	TOT UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39311	P.P'DDD SEDUG/KG	DRY WGT		WATER		2	1.855000	.1012500	.3182000	2.08	1.63	75/02/25	82/05/07
					K	2	3.500000	4.500000	2.121300	5.00	2.00	79/05/02	81/05/14
					TOT	4	2.677500	2.435800	1.560700	5.00	1.63	75/02/25	82/05/07
39315	O.P' DDD WHL SMPL	UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39316	O.P' DDD MUD DRY	UG/KG		WATER	K	4	2.275000	4.102500	2.025500	5.00	.10	75/02/25	82/05/07
39320	P.P'DDE	TOT UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39321	P.P'DDE SEDUG/KG	DRY WGT		WATER		2	.9700000	1.125000	1.060700	1.72	.22	75/02/25	82/05/07
					K	2	3.500000	4.500000	2.121300	5.00	2.00	79/05/02	81/05/14
					TOT	4	2.235000	4.008600	2.002200	5.00	.22	75/02/25	82/05/07
39327	O P DDE WHL SMP	L UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39328	O.P'DDE MUD	UG/KG		WATER	K	1	5.000000			5.00	5.00	79/05/02	79/05/02
39330	ALDRIN	TOT UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39333	ALDRIN SEDUG/KG	DRY WGT		WATER	K	4	1.775000	1.469200	1.212100	3.00	.10	75/02/25	82/05/07
39337	ALPHABHC	TOTUG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39338	BETA BHC	TOTUG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39343	GBHC-MUD LINDANE	DRYUG/KG		WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39380	DIELLRIN	TOTUG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39383	DIELLRIN SEDUG/KG	DRY WGT		WATER		1	1.080000			1.08	1.08	75/02/25	75/02/25
					K	3	4.666700	21.33300	4.618800	10.00	2.00	79/05/02	82/05/07
					TOT	4	3.770000	17.43800	4.175900	10.00	1.08	75/02/25	82/05/07
39390	ENDRIN	TOT UG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39393	ENDRIN SEDUG/KG	DRY WGT		WATER	K	4	3.525000	19.43600	4.408600	10.00	.10	75/02/25	82/05/07
39398	ETHION WHL SMPL	UG/L		WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39399	ETHION MUD	UG/KG		WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/02/25	82/05/07
39400	TOXAPHEN	TOTUG/L		WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06

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39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	4	13.52500	592.1000	24.33300	50.00	.10	75/02/25	82/05/07
39410	HEPTCHLR		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	4	1.775000	1.469200	1.212100	3.00	.10	75/02/25	82/05/07
39420	HPCHLREP		TOTUG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	4	3.525000	19.43600	4.408600	10.00	.10	75/02/25	82/05/07
39480	METHXYCLR	WHL SMPL	UG/L	WATER	K	1	.0500000			.050	.050	82/05/06	82/05/06
39516	PCBS	WHL SMPL	UG/L	WATER	K	6	.5000000	.0000000	.0000000	.500	.500	79/05/02	82/05/06
39519	PCBS	MUD	UG/KG	WATER	K	3	40.00000	2700.000	51.96200	100.00	10.00	79/05/02	82/05/07
39530	MALATHN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39531	MALATHN	MUD	UG/KG	WATER	K	4	14.75000	554.2500	23.54300	50.00	1.00	75/02/25	82/05/07
39540	PARATHN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39541	PARATHN	MUD	UG/KG	WATER	K	4	9.750000	184.2500	13.57400	30.00	1.00	75/02/25	82/05/07
39570	DIAZINON	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39571	DIAZINON	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/02/25	82/05/07
39580	GUTHION	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39581	GUTHION	MUD DRY	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/02/25	82/05/07
39610	PHOSDRIN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39782	LINDANE	WHL SMPL	UG/L	WATER	K	6	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39783	LINDANE	MUD DRY	UG/KG	WATER	K	4	2.275000	4.102500	2.025500	5.00	.10	75/02/25	82/05/07
39786	TRITHION	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39787	TRITHION	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	4.00	1.00	75/02/25	82/05/07
46570	CAL HARD	CA MG	MG/L	WATER	$	1	3704.000			3704	3704	86/05/12	86/05/12
70320	MOISTURE	CONTENT	PERCENT	WATER		1	58.60000			59	59	75/02/25	75/02/25
70322	RESIDUE	TOT VOL	PERCENT	WATER		2	5.315000	10.71900	3.273900	7.6	3.0	75/02/25	81/05/14
70507	PHOS-T	ORTHO	MG/L P	WATER		7	.0357140	.0001952	.0139730	.060	.020	75/06/03	76/03/25
					K	2	.0200000	.0000000	.0000000	.020	.020	75/08/06	76/06/07
					TOT	9	.0322220	.0001944	.0139440	.060	.020	75/06/03	76/0 /07
71900	MERCURY	HG,TOTAL	UG/L	WATER		68	.8992600	1.944400	1.394400	9.9	.05	74/02/14	87/10/08
					K	31	.2677400	.0222580	.1491900	.8	.2	75/11/07	87/07/06
					TOT	99	.7015100	1.422800	1.192800	9.9	.05	74/02/14	87/10/08
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		1	.0800000			.08	.08	75/02/25	75/02/25
					K	3	.2166700	.0008333	.0288680	.3	.2	79/05/02	82/05/07
					TOT	4	.1825000	.0052250	.0722840	.3	.08	75/02/25	82/05/07
74041	WQF	SAMPLE	UPDATED	WATER		237	868010.0	39526000	6287.000	880419	860529	84/08/06	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.5500000			.55	.55	75/02/25	75/02/25
82028	RATIO	FEC COL	FEC STRP	WATER	$	23	2.298000	14.21300	3.770000	18	.1	79/05/02	82/08/12
82048	BOT DPTH	OF SMPL	METERS	WATER		1258	5.751700	15.46000	3.931900	14.00	.30	74/05/21	87/12/21

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TYPE/AMBIENT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		324	50.00000	.0000000	.0000000	50.0	50.0	74/01/08	87/12/21
00008	LAL	IDENT.	NUMBER	WATER		2	4.000000	.0000000	.0000000	4	4	74/01/08	74/01/08
00010	WATER	TEMP	CENT	WATER		981	20.45900	50.40900	7.099900	32.0	5.0	74/01/08	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	981	68.82300	163.3800	12.78200	89.6	41.0	74/01/08	87/12/21
00020	AIR	TEMP	CENT	WATER		209	20.25600	53.01800	7.281400	34.5	4.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		17	20.76500	4.941900	2.223000	29.0	20.0	81/02/20	81/11/05
00041	WEATHER	WMO CODE	4501	WATER		227	2.052900	27.05000	5.201000	22	0	80/01/15	87/12/21
00067	TILE	STAGE	CODE	WATER		84	2728.600	927340.0	962.9900	4300	2000	81/03/10	87/12/21
00075	TURB	HLGE	PPM SIO2	WATER		2	5.250000	6.125000	2.474900	7.0	3.5	74/01/08	74/02/14
00076	TURB	TRBIDMTR	HACH FTU	WATER		139	6.377600	19.26300	4.388900	22.0	.5	74/04/19	87/12/21
00080	COLOR	PT-CO	UNITS	WATER		19	25.66900	52.26700	7.229600	40	8	74/01/08	78/04/24
00300	DO		MG/L	WATER		993	7.208400	4.176800	2.043700	14.2	3.1	74/01/08	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	981	76.37800	178.4400	13.35800	125.7	37.8	74/01/08	87/12/21
00310	BOD	5 DAY	MG/L	WATER		141	1.730100	.8740300	.9348900	7.0	.1	74/01/08	87/12/21
					K	4	1.000000	.0000000	.0000000	1.0	1.0	76/06/07	84/10/29
					TOT	145	1.710000	.8641600	.9296000	7.0	.1	74/01/08	87/12/21
00339	COD MUD	DRY WGT	MG/KG	WATER		1	122000.0			122000	122000	75/02/25	75/ 2/25
00340	COD	HI LEVEL	MG/L	WATER		7	242.2900	60454.00	245.8700	772	80	74/09/17	76/03/25
00400	PH		SU	WATER		140	7.597100	.2783300	.5275700	9.10	4.20	74/01/08	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		951	27987.00	98339000	9941.800	49000	1100	78/04/24	87/12/21
00403	PH	LAB	SU	WATER		146	7.507100	.1461800	.3823300	8.2	6.0	74/01/08	87/12/21
00410	T ALK	CACO3	MG/L	WATER		145	65.41700	506.0200	22.49500	180	27	74/01/08	87/12/21
00480	SALINITY		PPTH	WATER		958	19.50000	39.76300	6.305800	32.5	1.5	74/08/02	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		2	31.30000	1220.200	34.93100	56	7	76/04/24	82/08/12
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		1	1340.000			1340.000	1340.000	75/02/25	75/02/25
00610	NH3+NH4-	N TOTAL	MG/L	WATER		103	.2583500	.1218700	.3491000	2.900	.050	75/04/29	87/12/21
					K	13	.0492310	.0003577	.0189130	.100	.020	74/11/27	87/09/28
					TOT	116	.2349100	.1125200	.3354400	2.900	.020	74/11/27	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	94	.0062405	.0000741	.0086129	.050	.0000004	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	94	.0075878	.0001096	.0104720	.061	.0000005	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		108	.6925000	.3146400	.5609300	4.600	.050	74/11/27	87/12/21
					K	5	.1020000	.0035200	.0593300	.200	.050	75/03/27	84/10/29
					TOT	113	.6663700	.3156000	.5617800	4.600	.050	74/11/27	87/12/21
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		1	2471.000			2471.00	2471.00	75/02/25	75/02/25
00630	NO2&NO3	N-TOTAL	MG/L	WATER		131	.1132100	.0076447	.0874340	.67	.02	74/01/08	87/12/21
					K	1	.0200000			.02	.02	84/12/14	84/12/14
					TOT	132	.1125000	.0076521	.0874760	.67	.02	74/01/08	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		11	.2727300	.1916000	.4377200	1.56	.00	74/01/08	75/04/29
					K	2	.0600000	.0000000	.0000000	.06	.06	75/03/17	75/03/27

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00660	ORTHOPO4	PO4	MG/L	WATER	TOT	13	.2400000	.1660500	.4074900	1.56	.00	74/01/08	75/04/29
00665	PHOS-TOT		MG/L P	WATER		94	.0869150	.0026345	.0513280	.240	.020	75/11/07	87/10/08
					K	22	.0759090	.0045778	.0676590	.300	.020	74/11/27	87/12/21
					TOT	116	.0848270	.0029853	.0546380	.300	.020	74/11/27	87/12/21
00680	T ORG C	C	MG/L	WATER		43	4.952100	4.919500	2.218000	11.6	2.1	74/11/27	87/10/08
00900	TOT HARD	CACO3	MG/L	WATER		3	2333.300	1343300	1159.000	3400	1100	79/01/30	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		1	210.0000			210.0	210.0	86/05/12	86/05/12
00925	MGNSIUM	MG.DISS	MG/L	WATER		13	208.2400	17897.00	133.7800	450.0	.3	75/02/24	76/06/07
00927	MGNSIUM	MG.TOT	MG/L	WATER		1	690.0000			690.0	690.0	86/05/12	86/05/12
00940	CHLORIDE	TOTAL	MG/L	WATER		1	17500.00			17500	17500	87/08/28	87/08/28
01000	ARSENIC	AS.DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/27	74/11/27
01025	CADMIUM	CD.DISS	UG/L	WATER		2	67.50000	2812.500	53.03300	105	30	74/01/08	77/08/25
					K	19	15.79000	436.8400	20.90100	100	10	74/02/14	77/04/15
					TOT	21	20.71400	775.7200	27.85200	105	10	74/01/08	77/08/25
01027	CADMIUM	CD.TOT	UG/L	WATER		2	37.00000	338.0000	18.38500	50	24	78/04/24	78/07/21
					K	29	10.00000	.0000000	.0000000	10	10	78/10/13	87/10/08
					TOT	31	11.74200	56.73100	7.532000	50	10	78/04/24	87/10/08
01028	CD MUD	DRY WGT	MG/KG-CD	WATER	K	1	.5000000			.50	.50	75/02/25	75/02/25
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		1	26.00000			26.00	26.00	75/02/25	75/02/25
01030	CHROMIUM	CR.DISS	UG/L	WATER	K	21	54.76200	226.1900	15.04000	100	50	74/01/08	77/08/25
01034	CHROMIUM	CR.TOT	UG/L	WATER	K	31	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/08
01040	COPPER	CU.DISS	UG/L	WATER		3	130.0000	300.0000	17.32100	140	110	74/07/12	74/11/27
					K	24	95.83300	199.2800	14.11700	100	50	74/01/08	77/08/25
					TOT	27	99.63000	319.0900	17.86300	140	50	74/01/08	77/08/25
01042	COPPER	CU.TOT	UG/L	WATER		2	75.00000	1250.000	35.35530	100	50	79/07/27	81/10/28
					K	35	62.85700	491.6000	22.17200	100	50	78/04/24	87/10/08
					TOT	37	63.51400	506.7600	22.51130	100	50	78/04/24	87/10/08
01043	COPPER	SEDMG/KG	DRY WGT	WATER		1	15.00000			15.00	15.00	75/02/25	75/02/25
01045	IRON	FE.TOT	UG/L	WATER		37	386.2200	22513.00	150.0500	700	170	78/04/24	87/10/08
01046	IRON	FE.DISS	UG/L	WATER		25	464.3600	134790.0	367.1300	1485	128	74/01/08	77/08/25
					K	2	100.0000	.0000000	.0000000	100	100	74/02/14	77/02/10
					TOT	27	437.3700	133870.0	365.8900	1485	100	74/01/08	77/08/25
01049	LEAD	PB.DISS	UG/L	WATER		15	149.3300	6163.600	78.51000	380	70	74/07/12	77/08/25
					K	12	75.00000	3409.100	58.38800	200	50	74/01/08	77/04/15
					TOT	27	116.3000	6178.100	78.60100	380	50	74/01/08	77/08/25
01051	LEAD	PB.TOT	UG/L	WATER		23	228.2600	12570.00	112.1200	520	60	78/04/24	84/04/27
					K	8	50.00000	.0000000	.0000000	50	50	86/02/14	87/10/08
					TOT	31	182.2600	15505.00	124.5200	520	50	78/04/24	87/10/08
01052	LEAD	SEDMG/KG	DRY WGT	WATER		1	3.000000			3.00	3.00	75/02/25	75/02/25

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32 48 20.0 079 56 00.0 3
TOWN CK UNDER GRACE MEMORIAL BR
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER MARINE
21SC00WQ HQ 03050201030 0001.680 OFF
0000 FEET DEPTH

TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	483.0000			483.00	483.00	75/02/25	75/02/25
01055	MANGNESE	MN	UG/L	WATER		6	53.33300	28.67000	5.164300	60.0	50.0	81/04/22	83/07/06
					K	31	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/08
					TOT	37	50.64100	6.257000	2.292800	60.0	50.0	78/04/24	87/10/08
01056	MANGNESE	MN,DISS	UG/L	WATER		3	246.6700	110230.0	332.0230	630.0	50.0	75/02/24	75/04/29
					K	15	50.00000	.0000000	.0000000	50.0	50.0	75/03/17	77/08/25
					TOT	18	82.77800	18657.00	136.5930	630.0	50.0	75/02/24	77/08/25
01065	NICKEL	NI,DISS	UG/L	WATER		7	102.8600	57.15600	7.560200	120	100	75/02/24	77/08/25
					K	11	100.0000	.0000000	.0000000	100	100	75/03/17	77/04/15
					TOT	18	101.1100	22.22800	4.714700	120	100	75/02/24	77/08/25
01067	NICKEL	NI,TOTAL	UG/L	WATER		19	132.6300	3964.900	62.96800	250	50	78/04/24	85/10/22
					K	18	61.11100	457.5200	21.39000	100	50	79/05/01	87/10/08
					TOT	37	97.83800	3511.900	59.26100	250	50	78/04/24	87/10/08
01066	NICKEL	SEDMG/KG	DRY WGT	WATER		1	20.00000			20.00	20.00	75/02/25	75/02/25
01090	ZINC	ZN,DISS	UG/L	WATER		1	100.0000			100	100	75/02/24	75/02/24
					K	18	100.0000	.0000000	.0000000	100	100	74/11/27	77/08/25
					TOT	19	100.0000	.0000000	.0000000	100	100	74/11/27	77/08/25
01092	ZINC	ZN,TOT	UG/L	WATER		23	203.4800	62587.00	250.1800	1200	50	78/04/24	87/10/08
					K	14	60.71400	453.3000	21.29130	100	50	78/10/13	87/07/23
					TOT	37	149.4600	43339.00	208.1800	1200	50	78/04/24	87/10/08
01093	ZINC	SEDMG/KG	DRY WGT	WATER		1	60.00000			60.00	60.00	75/02/25	75/02/25
31615	FEC COLI	MFNECMED	/100ML	WATER		1	42.00000			42	42	82/03/19	82/03/19
31 16	FEC COLI	MFM-FCBR	/100ML	WATER		96	120.4300	18181.00	134.8400	920	2	74/01/08	87/12/21
					J	40	135.0300	47129.00	217.0900	850	4	76/09/09	87/09/28
					L	5	408.0000	131520.0	362.6630	800	80	75/06/03	84/10/29
					TOT	141	134.7700	32031.00	178.9700	920	2	74/01/08	87/12/21
39301	P,P'DDT	SEDUG/KG	DRY WGT	WATER		1	1.170000			1.17	1.17	75/02/25	75/02/25
39306	O,P' DDT	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER		1	.2900000			.29	.29	75/02/25	75/02/25
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER		1	.2600000			.26	.26	75/02/25	75/02/25
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39343	GBHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39399	ETHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25

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TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39531	MALATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39541	PARATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39571	DIAZINON	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39581	GUTHION	MUD DRY	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
39783	LINDANE	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39787	TRITHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/02/25	75/02/25
40570	CAL HARD	CA MG	MG/L	WATER	$	1	3366.800			3366	3366	86/05/12	86/05/12
70320	MOISTURE	CONTENT	PERCENT	WATER		1	73.20000			73	73	75/02/25	75/02/25
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	13.00000			13.0	13.0	75/02/25	75/02/25
70507	PHOS-T	ORTHO	MG/L P	WATER		8	.0250000	.0000571	.0075593	.040	.020	75/06/03	79/07/27
					K	1	.0200000			.020	.020	76/03/25	76/03/25
					TOT	9	.0244450	.0000527	.0072649	.040	.020	75/06/03	79/07/27
71900	MERCURY	HG,TOTAL	UG/L	WATER		37	.8537800	.9493900	.9743700	4.2	.2	74/02/14	85/10/22
					K	24	.3375000	.0311410	.1764700	.8	.2	74/01/08	87/10/08
					TOT	61	.6506500	.6462400	.8038900	4.2	.2	74/01/08	87/10/08
71921	MERCURY	SEDMG/KG	DRY WGT	WATER	K	1	.0300000			.03	.03	75/02/25	75/02/25
74041	WGF	SAMPLE	UPDATED	WATER		237	867880.0	38886000	6235.900	880419	860529	84/08/06	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	.6000000			.60	.60	75/02/25	75/02/25
82048	DOT EPTH	OF SMPL	METERS	WATER		988	5.597800	15.76600	3.970600	14.00	.30	74/01/08	87/12/21

TYPA/AMBNT/STREAM

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0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	MSAMPLOC	% FROM	RT BANK	WATER		234	47.02100	86.75200	9.314100	50.0	8.0	74/05/13	87/12/01
00010	WATER	TEMP	CENT	WATER		334	20.91600	45.46000	6.742400	32.0	6.0	74/05/13	87/12/01
00011	WATER	TEMP	FAHN	WATER	$	334	69.64600	147.3500	12.13900	89.6	42.8	74/05/13	87/12/01
00020	AIR	TEMP	CENT	WATER		98	23.76000	66.65100	8.164000	49.0	-3.0	80/01/30	87/12/01
00021	AIR	TEMP	FAHN	WATER		1	28.00000			28.0	28.0	81/08/07	81/08/07
00036	WIND	DIR.FROM	NORTH-0	WATER		10	85.60000	4683.600	68.43700	225	1	79/05/02	80/02/29
00041	WEATHER	WMO CODE	4501	WATER		108	2.314800	27.82500	5.275000	22	0	80/01/30	87/12/01
00067	TIDE	STAGE	CODE	WATER		198	3126.800	982880.0	991.4100	4100	2000	79/05/02	85/12/12
00076	TURB	TRBIDMTR	HACH FTU	WATER		160	10.18800	102.0800	10.10300	69.0	.3	74/05/13	87/12/01
00078	TRANSP	SECCHI	METERS	WATER		23	1.093500	.0987100	.3141800	1.70	.50	79/05/02	82/11/09
00080	COLOR	PT-CO	UNITS	WATER		5	44.00000	1030.000	32.09400	100	20	74/05/13	75/10/14
00116	INTRSVE	SURVEY	IDENT	WATER		94	794510.0	.0000000	.0000000	794512	794512	79/05/02	80/11/06
00300	DO		MG/L	WATER		317	6.803100	3.528900	1.878630	13.8	2.6	74/05/13	87/12/01
00301	DO	SATUR	PERCENT	WATER	$	315	74.28600	171.8000	13.10700	119.0	32.9	74/05/13	87/12/01
00310	BOD	5 DAY	MG/L	WATER		150	2.657100	1.514900	1.230800	7.1	.6	74/05/13	87/12/01
00335	COD	LOWLEVEL	MG/L	WATER		18	109.0600	36709.00	191.6000	790.0	9.1	77/10/17	87/10/01
					K	2	5.000000	.0000000	.0000000	5.0	5.0	80/10/23	83/07/25
					TOT	20	98.65000	33870.00	184.0400	790.0	5.0	77/10/17	87/10/01
00339	COD MUD	DRY WGT	MG/KG	WATER		10	30220.00	6656E+05	25800.00	86000	1700	77/02/15	86/12/02
00340	COD	HI LEVEL	MG/L	WATER		14	247.6400	64955.00	254.8600	930	31	76/06/21	86/04/03
00400	PH		SU	WATER		141	7.227600	.1602100	.4002700	8.20	5.90	74/05/13	87/12/01
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		297	21002.00	65813000	7470.800	37000	15	78/04/11	87/12/01
00403	PH	LAB	SU	WATER		169	7.385700	.0546880	.2338500	7.8	6.6	74/05/13	87/12/01
00410	T ALK	CACO3	MG/L	WATER		168	75.93800	304.3900	17.44700	130	5	74/05/13	87/12/01
00480	SALINITY		PPTH	WATER		299	14.25800	26.01100	5.100100	24.0	.0	74/10/10	87/12/01
00530	RESIDUE	TOT NFLT	MG/L	WATER		23	12.28700	60.70900	7.791600	29	2	79/05/02	82/11/09
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		11	825.4600	1221600	1105.200	3300.000	80.000	77/02/15	87/12/01
00610	NH3+NH4-	N TOTAL	MG/L	WATER		111	.3333300	1.527900	1.236100	13.000	.020	76/09/23	87/10/01
					K	31	.0512900	.0002249	.0149990	.100	.020	76/07/20	87/12/01
					TOT	142	.2717600	1.205700	1.098000	13.000	.020	76/07/20	87/12/01
00612	UN-IONZD	NH3-N	MG/L	WATER	$	133	.0022059	.0000114	.0033768	.021	.00002	76/07/20	87/12/01
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	133	.0026821	.0000168	.0041059	.025	.00002	76/07/20	87/12/01
00625	TOT KJEL	N	MG/L	WATER		123	.7992600	.2697900	.5194200	4.400	.130	76/07/20	87/12/01
					K	6	.1000000	.0000000	.0000000	.100	.100	80/02/21	84/11/05
					TOT	129	.7667400	.2790000	.5282100	4.400	.100	76/07/20	87/12/01
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		5	650.6000	972110.0	985.9600	2400.00	7.50	77/02/15	85/03/04
					K	5	8.000000	151.2500	12.29800	30.00	2.50	79/02/08	83/09/06
					TOT	10	329.2500	546780.0	739.4500	2400.00	2.50	77/02/15	85/03/04
00627	KJELDL	N TOT MU L	MG/KG	WATER		3	2238.700	1123700	1060.100	2900.000	1016.000	86/01/06	87/12/01

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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00630	NO2&NO3	N-TOTAL	MG/L	WATER		133	.0854880	.0178030	.1334300	1.27	.02	74/06/13	87/12/01
					K	19	.0200000	.0000000	.0000000	.02	.02	76/03/09	87/09/08
					TOT	152	.0773020	.0160350	.1266300	1.27	.02	74/06/13	87/12/01
00660	ORTHOPO4	PO4	MG/L	WATER		4	.1125000	.0062250	.0788990	.18	.00	74/06/13	74/10/10
00665	PHOS-TOT		MG/L P	WATER		116	.1062600	.0058910	.0767530	.440	.030	76/09/23	87/11/02
					K	23	.0473910	.0000747	.0086436	.050	.020	76/07/20	87/12/01
					TOT	139	.0956830	.0053869	.0733950	.440	.020	76/07/20	87/12/01
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		10	758.7100	558230.0	747.1530	2070.0	13.8	77/02/15	87/12/01
					K	3	2.500000	.0000000	.0000000	2.5	2.5	82/03/23	83/09/06
					TOT	13	584.2000	528640.0	727.0800	2070.0	2.5	77/02/15	87/12/01
00680	T ORG C	C	MG/L	WATER		66	8.481800	28.73300	5.072800	33.2	2.8	76/06/21	87/10/01
00900	TOT HARD	CACO3	MG/L	WATER		4	2390.000	852400.0	923.2600	3400	1160	78/03/09	86/06/02
00916	CALCIUM	CA-TOT	MG/L	WATER		2	190.0000	1800.000	42.42700	220.0	160.0	85/02/11	86/06/02
00925	MGNSIUM	MG,DISS	MG/L	WATER		1	356.0000			356.0	356.0	75/08/28	75/08/28
00927	MGNSIUM	MG,TOT	MG/L	WATER		2	600.0000	16200.00	127.2800	690.0	510.0	85/02/11	86/06/02
00940	CHLORIDE	TOTAL	MG/L	WATER		21	7209.500	13357000	3654.800	17000	3000	79/05/02	83/10/07
01003	ARSENIC	SEDMG/KG	DRY WGT	WATER		1	2.200000			2.20	2.20	83/09/06	83/09/06
01025	CADMIUM	CD,DISS	UG/L	WATER		2	20.00000	.0000000	.0000000	20	20	75/08/28	77/10/17
					K	4	10.00000	.0000000	.0000000	10	10	76/08/30	77/04/05
					TOT	6	13.33300	26.66700	5.164000	20	10	75/08/28	77/10/17
01027	CADMIUM	CD,TOT	UG/L	WATER		3	17.33300	121.3300	11.01500	30	10	77/07/20	79/01/24
					K	33	10.00000	.0000000	.0000000	10	10	78/04/11	87/10/01
					TOT	36	10.61100	11.15900	3.340500	30	10	77/07/20	87/10/01
01028	CD MUD	DRY WGT	MG/KG-CD	WATER		3	1.000000	.0000000	.0000000	1.00	1.00	78/01/31	85/03/04
					K	10	.9910000	.0006323	.0251470	1.00	.92	77/02/15	87/12/01
					TOT	13	.9930800	.0004898	.0221330	1.00	.92	77/02/15	87/12/01
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		13	13.22300	64.82000	8.051100	30.00	6.00	77/02/15	87/12/01
01030	CHROMIUM	CR,DISS	UG/L	WATER	K	6	50.00000	.0000000	.0000000	50	50	75/08/28	77/10/17
01034	CHROMIUM	CR,TOT	UG/L	WATER		1	190.0000			190	190	80/04/01	80/04/01
					K	54	50.00000	.0000000	.0000000	50	50	77/07/20	87/10/01
					TOT	55	52.54600	356.3700	18.87800	190	50	77/07/20	87/10/01
01040	COPPER	CU,DISS	UG/L	WATER	K	8	100.0000	.0000000	.0000000	100	100	74/08/22	77/10/17
01042	COPPER	CU,TOT	UG/L	WATER		6	70.00000	600.0000	24.49500	100	50	79/07/18	82/10/22
					K	55	70.00000	611.1100	24.72100	100	50	77/07/20	87/10/01
					TOT	61	70.00000	600.0000	24.49500	100	50	77/07/20	87/10/01
01043	COPPER	SEDMG/KG	DRY WGT	WATER		10	34.84000	1984.300	44.54500	149.00	7.80	77/02/15	87/12/01
					K	3	5.000000	.0000000	.0000000	5.00	5.00	81/05/14	83/02/07
					TOT	13	27.95400	1659.500	40.73600	149.00	5.00	77/02/15	87/12/01
01045	IRON	FE,TOT	UG/L	WATER		61	812.9500	5277300	2297.300	18000	200	77/07/20	87/10/01

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PARAMETER				MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01046	IRON	FE,DISS	UG/L	WATER		8	425.0000	77429.00	278.2600	950	100	74/08/22	77/10/17
01049	LEAD	PB,DISS	UG/L	WATER		6	123.3300	3146.700	56.09500	200	60	74/08/22	77/10/17
					K	2	50.00000	.0000000	.0000000	50	50	74/10/10	76/11/12
					TOT	8	105.0000	3400.000	58.31000	200	50	74/08/22	77/10/17
01051	LEAD	PB,TOT	UG/L	WATER		47	242.9800	10500.00	102.4700	500	100	77/07/20	84/04/05
					K	8	50.00000	.0000000	.0000000	50	50	86/01/06	87/10/01
					TOT	55	214.9100	13659.00	116.8700	500	50	77/07/20	87/10/01
01052	LEAD	SEDMG/KG	DRY WGT	WATER		13	38.95400	3987.900	63.15000	245.00	6.90	77/02/15	87/12/01
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		1	140.0000			140.00	140.00	83/09/06	83/09/06
01055	MANGNESE	MN	UG/L	WATER		26	106.1500	10825.00	104.0400	550.0	50.0	77/07/20	87/07/07
					K	16	53.12500	156.2500	12.50000	100.0	50.0	79/01/24	87/10/01
					TOT	42	85.95200	7336.900	85.65600	550.0	50.0	77/07/20	87/10/01
01056	MANGNESE	MN,DISS	UG/L	WATER		2	105.0000	4050.000	63.64030	150.0	60.0	75/08/28	76/08/30
					K	4	50.00000	.0000000	.0000000	50.0	50.0	76/11/12	77/10/17
					TOT	6	68.33300	1616.700	40.20800	150.0	50.0	75/08/28	77/10/17
01065	NICKEL	NI,DISS	UG/L	WATER		5	154.0000	8280.000	90.99500	310	100	75/08/28	77/10/17
					K	1	100.0000			100	100	76/12/14	76/12/14
					TOT	6	145.0000	7110.000	84.32100	310	100	75/08/28	77/10/17
01067	NICKEL	NI,TOTAL	UG/L	WATER		27	158.1500	6106.000	78.15400	330	50	77/07/20	87/02/03
					K	15	60.00000	428.5700	20.70200	100	50	78/01/31	87/10/01
					TOT	42	123.1000	6286.300	79.28000	330	50	77/07/20	87/10/01
01068	NICKEL	SEDMG/KG	DRY WGT	WATER		7	8.300000	11.10300	3.332200	15.00	5.00	79/02/08	87/12/01
					K	3	8.066700	7.213400	2.685800	10.00	5.00	77/02/15	83/02/07
					TOT	10	8.230000	9.017900	3.003000	15.00	5.00	77/02/15	87/12/01
01090	ZINC	ZN,DISS	UG/L	WATER	K	6	100.0000	.0000000	.0000000	100	100	75/08/28	77/10/17
01092	ZINC	ZN,TOT	UG/L	WATER		41	198.0500	205560.0	453.3900	3000	50	77/07/20	87/02/03
					K	20	70.00000	631.5800	25.13100	100	50	78/01/31	87/10/01
					TOT	61	156.0700	140920.0	375.3900	3000	50	77/07/20	87/10/01
01093	ZINC	SEDMG/KG	DRY WGT	WATER		13	71.30000	10550.00	102.7100	390.00	10.00	77/02/15	87/12/01
31501	TOT COLI	MFIMENDO	/100ML	WATER		10	44.60000	1310.300	36.19800	100	4	79/05/02	82/11/09
					J	12	36.83300	1676.700	40.94800	160	8	79/08/02	81/11/05
					TOT	22	40.36400	1455.500	38.15100	160	4	79/05/02	82/11/09
31506	TOT COLI	MPN CONF	TUBE CODE	WATER		4	372.2500	148640.0	385.5400	920	49	79/09/06	82/05/25
31615	FEC COLI	MPNECMED	/100ML	WATER		7	119.1400	12018.00	109.6300	350	17	79/09/06	82/05/25
					J	1	284.0000			284	284	85/07/08	85/07/08
					TOT	8	139.7500	13698.00	117.0400	350	17	79/09/06	85/07/08
31616	FEC COLI	MFM-FCBR	/100ML	WATER		109	37.54600	5405.200	73.52000	570	2	74/05/13	87/12/01
					J	43	64.04700	17268.00	131.4100	680	1	76/08/07	87/11/02
					K	3	2.333300	.3333400	.5773500	3	2	76/08/31	81/08/07

'TYPE/AMBNT/STREAM

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WANDO RVR AT SC 41
45019 SOUTH CAROLINA CHARLESTON
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21SC60WQ HQ 03050201002 0010.760 OFF
0000 FEET DEPTH

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
31616	FEC COLI MFM-FCBR		/100ML	WATER	L	4	245.0000	136900.0	370.0000	800	60	77/12/02	80/10/23
31616	FEC COLI MFM-FCBR		/100ML	WATER	TOT	159	49.26700	12050.00	109.7700	800	1	74/05/13	87/12/01
31673	FECSTREP MFKFAGAR		/100ML	WATER		16	254.6300	247320.0	497.3100	2000	5	79/05/02	82/11/09
					J	5	60.20000	12481.00	111.7200	260	8	79/08/02	80/11/06
					K	1	1.000000			1	1	80/02/29	80/02/29
					TOT	22	198.9100	187840.0	433.4100	2000	1	79/05/02	82/11/09
34257	BETA BHC	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.000	2.000	86/12/02	87/12/01
34354	ENDSULSF	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/01	87/12/01
34359	BENDOSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/01	87/12/01
34364	AENDOSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/01	87/12/01
34369	ENDRINAL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/01	87/12/01
39076	ALPHABHC	SEDUG/KG	DRY WGT	WATER	K	3	2.333300	.3333400	.5773500	3.000	2.000	79/05/02	87/12/01
39300	P,P'EDT		TOT UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39301	P,P'LDT	SEDUG/KG	DRY WGT	WATER	K	14	2.157200	1.913400	1.383300	5.00	.10	77/02/15	87/12/01
39305	O,P' DDT	WHL SMPL	UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39306	O,P' DDT	MUD DRY	UG/KG	WATER	K	14	2.157200	1.913400	1.383300	5.00	.10	77/02/15	87/12/01
39310	P,P'DDD		TOT UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER	K	14	2.157200	1.913400	1.383300	5.00	.10	77/02/15	87/12/01
39315	O,P' DDD	WHL SMPL	UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	14	2.157200	1.913400	1.383300	5.00	.10	77/02/15	87/12/01
39320	P,P'DDE		TOT UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER	K	14	2.157200	1.913400	1.383300	5.00	.10	77/02/15	87/12/01
39327	O,P DDE	WHL SMPL	UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39328	O,P'DDE	MUD	UG/KG	WATER	K	3	3.000000	3.000000	1.732100	5.00	2.00	79/05/02	87/12/01
39330	ALDRIN		TOT UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	14	1.871400	.6914300	.8315300	3.00	.10	77/02/15	87/12/01
39337	ALPHABHC		TOTUG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39338	BETA BHC		TOTUG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39351	CDANLDRY	TECH&MET	MUDUG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	86/12/02	87/12/01
39380	DILLDRIN		TOTUG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	14	2.871400	9.583800	3.095800	10.00	.10	77/02/15	87/12/01
39390	ENDRIN		TOT UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	13	2.938500	10.31400	3.211600	10.00	.10	77/02/15	87/12/01
39398	ETHION	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39399	ETHION	MUD	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	77/02/15	87/12/01
39400	TOXAPHEN		TOTUG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	14	8.585700	308.3100	17.55900	50.00	.10	77/02/15	87/12/01
39410	HEPTCHLR		TOTUG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	14	1.871400	.6914300	.8315300	3.00	.10	77/02/15	87/12/01

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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39420	HPCHLREP		TOTUG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	14	2.871400	9.583800	3.095800	10.00	.10	77/02/15	87/12/01
39481	MTHXYCLR	MUD DRY	UG/KG	WATER	K	3	2.000000	.0000000	.0000000	2.00	2.00	86/01/06	87/12/01
39491	PCB-1221	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39495	PCB-1232	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39499	PCB-1242	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39503	PCB-1248	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39507	PCB-1254	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39511	PCB-1260	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39514	PCB-1016	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/01	87/12/01
39516	PCES	WHL SMPL	UG/L	WATER	K	6	.5000000	.0000000	.0000000	.500	.500	79/05/02	82/05/06
39519	PCES	MUD	UG/KG	WATER		3	52.50000	3791.000	61.57100	123.50	13.80	77/02/15	82/03/23
					K	10	28.00000	1440.000	37.94700	100.00	10.00	79/02/08	86/12/02
					TOT	13	33.65400	1827.300	42.74700	123.50	10.00	77/02/15	86/12/02
39530	MALATHN	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39531	MALATHN	MUD	UG/KG	WATER	K	12	11.16700	330.3300	18.17500	50.00	1.00	77/02/15	87/12/01
39540	PARATHN	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39541	PARATHN	MUD	UG/KG	WATER	K	12	7.833300	108.5200	10.41700	30.00	1.00	77/02/15	87/12/01
39570	DIAZINON	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39571	DIAZINON	MUD	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	77/02/15	87/12/01
39580	GUTHION	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39581	GUTHION	MUD DRY	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	77/02/15	87/12/01
39610	PHOSERIN	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39701	HCB	SEDUG/KG	DRY WGT	WATER	K	1	4.000000			4.00	4.00	87/12/01	87/12/01
39758	MIREX	BOT MAT	UG/KG	WATER	K	2	3.000000	2.000000	1.414200	4.00	2.00	86/12/02	87/12/01
39782	LINDANE	WHL SMPL	UG/L	WATER	K	7	.0442860	.0002285	.0151190	.050	.010	78/01/31	82/05/06
39783	LINDANE	MUD DRY	UG/KG	WATER	K	14	2.157200	1.913400	1.383300	5.00	.10	77/02/15	87/12/01
39786	TRITHION	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	78/01/31	82/05/06
39787	TRITHION	MUD	UG/KG	WATER	K	10	3.400000	1.600000	1.264900	4.00	1.00	77/02/15	87/12/01
4057	CAL HARD	CA MG	MG/L	WATER	$	2	2945.200	396990.0	630.0700	3391	2500	85/02/11	86/06/02
70310	PH	SU	BOT MUD	WATER		6	7.483300	.2817400	.5307900	8.0	6.6	82/03/23	87/12/01
70320	MOISTURE	CONTENT	PERCENT	WATER		11	39.18200	354.1700	18.81900	75	22	77/02/15	87/12/01
70322	RESIDUE	TOT VOL	PERCENT	WATER		12	5.833300	27.37900	5.232500	17.0	1.0	77/02/15	87/12/01
70507	PHOS-T	ORTHO	MG/L P	WATER		4	.0975000	.0034250	.0585240	.160	.030	75/08/08	83/07/25
					K	1	.0200000			.020	.020	76/04/23	76/04/23
					TOT	5	.0820000	.0037700	.0614000	.160	.020	75/08/08	83/07/25
71900	MERCURY	HG.TOTAL	UG/L	WATER		35	.5688600	.2059500	.4538100	2.3	.2	74/08/22	87/10/01
					K	36	.2416700	.0110720	.1052200	.5	.2	76/07/20	87/07/07
					TOT	71	.4029600	.1327100	.3642900	2.3	.2	74/08/22	87/10/01

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WANDO RVR AT SC 41
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21SC60WQ HQ 0305020100 2 0010.760 OFF
0000 FEET DEPTH

	PARAMETER		MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
71921	MERCURY	SEDMG/KG DRY WGT	WATER		1	.4000000			.4	.4	79/02/08	79/02/08
				K	12	.2333300	.0024243	.0492370	.3	.1	77/02/15	87/12/01
				TOT	13	.2461500	.0043590	.0660230	.4	.1	77/02/15	87/12/01
74041	WQF	SAMPLE	UPDATED WATER		30	868930.0	35869000	5989.000	880615	860529	84/07/16	87/12/01
70453	PCB-1262	SED DRY	WT UG/KG WATER	K	1	10.00000			10.000	10.000	87/12/01	87/12/01
82028	RATIO	FEC COL	FEC STRP WATER	$	22	.6646800	1.862400	1.364700	6	.003	79/05/02	82/11/09
82048	BOT DPTH	OF SMPL	METERS WATER		297	2.315200	6.861500	2.421100	11.00	.30	74/05/13	87/12/01
85048	AVERAGE	NO./100	ACRES WATER		1	4.000000			4.00	4.00	81/05/19	81/05/19

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32 50 40.0 079 53 40.0 3
WANDO RVR BTWN RATHALL & HOBCAW CKS
45019 SOUTH CAROLINA CHARLESTON
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SANTEE COOPER
21SC60WQ HQ 03050201002 0003.130 OFF
0000 FEET DEPTH

TYPE/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		430	49.90700	3.722600	1.929400	50.0	10.0	74/02/14	87/12/21
00010	WATER	TEMP	CENT	WATER		1070	20.19400	47.49300	6.891500	32.0	5.5	74/05/21	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	1070	68.34200	154.2600	12.42000	89.6	41.9	74/05/21	87/12/21
00020	AIR	TEMP	CENT	WATER		206	20.85200	50.56000	7.110600	41.0	2.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		16	22.93800	16.59600	4.073800	29.0	20.0	81/02/17	81/11/05
00036	WIND	DIR.FROM	NORTH=0	WATER		10	85.60000	4683.600	68.43700	225	1	79/05/02	80/02/29
00041	WEATHER	WMO CODE	4501	WATER		221	2.018600	23.74300	4.872700	22	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		323	2947.700	990080.0	995.0300	4200	2000	79/05/02	87/12/21
00076	TURB	TRBIDMTR	HACH FTU	WATER		175	8.251100	105.7500	10.28300	94.0	.5	74/02/14	87/12/21
					L	1	100.0000			100.0	100.0	80/02/29	80/02/29
					TOT	176	8.772400	152.9700	12.36800	100.0	.5	74/02/14	87/12/21
00078	TRANSP	SECCHI	METERS	WATER		21	1.209100	.1640900	.4050900	2.25	.60	79/05/02	82/08/12
00080	COLOR	PT-CO	UNITS	WATER		20	28.76000	263.0600	16.21900	80	4	74/02/14	82/01/22
00116	INTNSVL	SURVEY	IDENT	WATER		149	794510.0	.0000000	.0000000	794512	794512	79/05/02	80/11/06
00300	DO		MG/L	WATER		1079	7.217500	4.272400	2.067000	18.0	4.0	74/05/21	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	1069	76.47900	183.4400	13.54400	155.2	50.0	74/05/21	87/12/21
00310	BOD	5 DAY	MG/L	WATER		141	1.823900	.7834800	.8851500	5.2	.2	74/02/14	87/12/21
					K	2	1.000000	.0000000	.0000000	1.0	1.0	78/12/15	84/08/21
					TOT	143	1.812400	.7818800	.8842400	5.2	.2	74/02/14	87/12/21
00335	COD	LOWLEVEL	MG/L	WATER		1	16.30000			16.3	16.3	84/01/30	84/01/30
00340	COD	HI LEVEL	MG/L	WATER		5	184.0000	5130.000	71.62430	280	100	75/12/12	76/03/25
00400	PH		SU	WATER		142	7.699600	.1568000	.3959900	8.90	6.20	74/05/21	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		1042	26644.00	60417000	7772.800	44000	1300	78/04/24	87/12/21
00403	PH	LAB	SU	WATER		179	7.611700	.1092700	.3305500	8.1	6.2	74/02/14	87/12/21
00410	T ALK	CACO3	MG/L	WATER		179	77.79300	3525.300	59.37400	820	20	74/02/14	87/12/21
00415	PHEN-PH-	LFIN ALK	MG/L	WATER		1	60.00000			60	60	74/07/12	74/07/12
00480	SALINITY		PPTH	WATER		1048	18.69000	22.49900	4.743300	32.0	1.5	74/08/02	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		44	29.30000	3534.600	59.45200	400	4	78/04/24	82/08/12
00610	NH3+NH4-	N TOTAL	MG/L	WATER		121	.2244600	.0561860	.2370400	1.500	.050	75/03/17	87/12/21
					K	27	.0485180	.0001977	.0140620	.100	.020	74/11/27	87/09/28
					TOT	148	.1923600	.0505500	.2248300	1.500	.020	74/11/27	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	128	.0054146	.0000554	.0074471	.042	.00002	75/02/24	87/12/21
00 19	UN-IONZD	NH3-NH3	MG/L	WATER	$	128	.0065836	.0000819	.0090548	.051	.00002	75/02/24	87/12/21
00625	TOT KJEL	N	MG/L	WATER		115	.8931300	1.730700	1.315600	13.000	.090	75/03/17	87/12/21
					K	12	.0933330	.0004424	.0210340	.120	.050	74/11/27	84/11/31
					TOT	127	.8175600	1.521100	1.233200	13.000	.050	74/11/27	87/12/21
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		3	670.4700	1325800	1151.400	2000.00	4.90	79/05/02	82/05/07
00630	NO2&NO3	N-TOTAL	MG/L	WATER		150	.1408000	.0724640	.2691900	2.52	.02	74/02/14	87/12/21
					K	5	.0200000	.0000000	.0000000	.02	.02	79/07/27	84/12/14

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21SC60WQ HQ 03050201002 0003.130 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00630	NO2&NO3	N-TOTAL	MG/L	WATER	TOT	155	.1369000	.0705700	.2656510	2.52	.02	74/02/14	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		11	.1400000	.0048801	.0698580	.24	.06	74/02/14	75/03/27
00665	PHOS-TOT		MG/L P	WATER		116	.1211200	.0594530	.2438300	2.600	.020	76/01/23	87/12/21
					K	27	.0581480	.0025157	.0501570	.300	.020	74/11/27	87/11/23
					TOT	143	.1092300	.0492210	.2218600	2.600	.020	74/11/27	87/12/21
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		3	1433.900	6117800	2473.400	4290.0	5.8	79/05/02	82/05/07
00680	T ORG C	C	MG/L	WATER		77	10.26400	762.0700	27.60610	175.0	1.9	76/01/23	87/10/08
					K	2	3.000000	8.000000	2.828400	5.0	1.0	78/11/06	81/11/05
					TOT	79	10.08000	743.9600	27.27600	175.0	1.0	76/01/23	87/10/08
00900	TOT HARD	CACO3	MG/L	WATER		3	2500.000	1560000	1249.000	3500	1100	79/01/30	87/05/14
00916	CALCIUM	CA-TOT	MG/L	WATER		1	220.0000			220.0	220.0	86/05/12	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		9	282.8900	9366.000	96.77800	411.0	131.0	75/02/24	76/03/25
00927	MGNSIUM	MG,TOT	MG/L	WATER		1	720.0000			720.0	720.0	86/05/12	86/05/12
00940	CHLORIDE	TOTAL	MG/L	WATER		34	9400.000	13013000	3607.300	21000	4400	79/05/02	82/05/06
01000	ARSENIC	AS,DISS	UG/L	WATER	K	2	52.50000	4512.500	67.17500	100	5	74/04/19	74/11/27
01025	CADMIUM	CD,DISS	UG/L	WATER		2	27.50000	12.50000	3.535500	30	25	77/08/25	77/10/24
					K	15	22.00000	1002.900	31.66800	100	10	74/02/14	77/04/28
					TOT	17	22.64700	881.6200	29.69200	100	10	74/02/14	77/10/24
01027	CADMIUM	CD,TOT	UG/L	WATER		3	38.00000	337.0000	18.35800	51	17	78/04/24	81/08/07
					K	28	10.00000	.0000000	.0000000	10	10	78/10/13	87/10/08
					TOT	31	12.71000	93.28000	9.658100	51	10	78/04/24	87/10/08
01028	CD MUD	DRY WGT	MG/KG-CD	WATER	K	3	1.000000	.0000000	.0000000	1.00	1.00	79/05/02	82/05/07
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		3	30.00000	9.000000	3.000000	33.00	27.00	79/05/02	82/05/07
01030	CHROMIUM	CR,DISS	UG/L	WATER		2	95.50000	2520.500	50.20500	131	60	74/02/14	76/03/25
					K	15	50.00000	.0000000	.0000000	50	50	74/04/19	77/10/24
					TOT	17	55.35300	385.8700	19.64400	131	50	74/02/14	77/10/24
01034	CHROMIUM	CR,TOT	UG/L	WATER		2	50.00000	.0000000	.0000000	50	50	78/07/21	80/02/29
					K	62	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/08
					TOT	64	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/08
01040	COPPER	CU,DISS	UG/L	WATER		2	140.0000	800.0000	28.28400	160	120	74/07/29	74/11/27
					K	21	97.61900	119.0500	10.91100	100	50	74/02/14	77/10/24
					TOT	23	101.3100	293.6800	17.13700	160	50	74/02/14	77/10/24
01042	COPPER	CU,TOT	UG/L	WATER		6	78.33300	976.6700	31.25200	130	50	79/07/27	83/05/23
					K	64	72.65600	629.3400	25.08700	100	50	78/04/24	87/10/08
					TOT	70	73.14300	647.9600	25.45500	130	50	78/04/24	87/10/08
01043	COPPER	SEDMG/KG	DRY WGT	WATER		3	12.66700	14.33400	3.786000	17.00	10.00	79/05/02	82/05/07
01045	IRON	FE,TOT	UG/L	WATER		70	648.5700	2305200	1518.300	13000	160	76/04/24	87/10/08
01046	IRON	FE,DISS	UG/L	WATER		21	547.2400	333150.0	577.1900	1942	125	74/02/14	77/10/24
					K	2	150.0000	5000.000	70.71100	200	100	74/04/19	77/02/10

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TYPA/AMBNT/STRLAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01046	IRON	FE,DISS	UG/L	WATER	TOT	23	512.7000	316190.0	562.3100	1942	100	74/02/14	77/10/24
01049	LEAD	PB,DISS	UG/L	WATER		19	161.3500	7155.200	84.58800	420	60	74/04/19	77/10/24
					K	4	87.50000	5625.000	75.00000	200	50	74/02/14	75/12/12
					TOT	23	148.5100	7440.500	86.25800	420	50	74/02/14	77/10/24
01051	LEAD	PB,TOT	UG/L	WATER		57	304.3900	10965.00	104.7100	540	110	78/04/24	84/04/27
					K	7	50.00000	.0000000	.0000000	50	50	86/02/14	87/10/08
					TOT	64	276.5600	16150.00	127.0800	540	50	78/04/24	87/10/08
01052	LEAD	SEDMG/KG	DRY WGT	WATER		3	24.00000	31.00000	5.567800	29.00	18.00	79/05/02	82/05/07
01055	MANGNESE	MN	UG/L	WATER		8	60.00000	200.0000	14.14200	90.0	50.0	78/07/21	83/07/06
					K	29	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/08
					TOT	37	52.16200	56.30900	7.503900	90.0	50.0	78/04/24	87/10/08
01056	MANGNESE	MN,DISS	UG/L	WATER		4	115.0000	6700.000	81.85430	220.0	50.0	75/02/24	76/02/26
					K	11	50.00000	.0000000	.0000000	50.0	50.0	75/03/17	77/10/24
					TOT	15	67.33300	2321.000	48.17600	220.0	50.0	75/02/24	77/10/24
01065	NICKEL	NI,DISS	UG/L	WATER		8	107.5000	107.1400	10.35130	120	100	75/02/24	77/10/24
					K	7	100.0000	.0000000	.0000000	100	100	75/03/17	76/03/25
					TOT	15	104.0000	68.57200	8.280800	120	100	75/02/24	77/10/24
01067	NICKEL	NI,TOTAL	UG/L	WATER		25	156.0000	5766.700	75.93900	380	60	78/07/21	85/10/22
					K	12	54.16700	208.3400	14.43400	100	50	78/04/24	87/10/08
					TOT	37	122.9700	6243.700	79.01750	380	50	78/04/24	87/10/08
01090	ZINC	ZN,DISS	UG/L	WATER		1	200.0000			200	200	76/10/26	76/10/26
					K	15	100.0000	.0000000	.0000000	100	100	74/11/27	77/10/24
					TOT	16	106.2500	625.0000	25.00000	200	100	74/11/27	77/10/24
01092	ZINC	ZN,TOT	UG/L	WATER		47	152.9800	15461.00	124.3400	700	50	78/07/21	87/10/08
					K	23	73.91300	652.1800	25.53800	100	50	76/04/24	87/04/13
					TOT	70	127.0000	11914.00	109.1500	700	50	78/04/24	87/10/08
01093	ZINC	SEDMG/KG	DRY WGT	WATER		3	41.66700	144.3400	12.01400	54.00	30.00	79/05/02	82/05/07
31501	TOT COLI	MFIMENDO	/100ML	WATER		18	321.0000	126780.0	356.0600	1140	36	79/05/02	82/08/12
					J	4	667.5000	669230.0	818.0600	1760	30	79/05/03	81/05/19
					TOT	22	384.0000	216950.0	465.7700	1760	30	79/05/02	82/08/12
31506	TOT COLI	MPN CONF	TUBECODL	WATER		1	40.0000			40	40	82/08/12	82/08/12
31615	FEC COLI	MPNECMED	/100ML	WATER		1	10.00000			10	10	81/02/17	81/02/17
3161	FEC COLI	MFM-FCBR	/100ML	WATER		119	46.24400	5038.200	70.98100	620	1	74/02/14	87/12/21
					J	32	26.37500	1706.600	41.31100	160	1	76/09/09	87/09/28
					K	2	2.500000	4.500000	2.121300	4	1	80/01/15	85/03/25
					L	4	65.00000	100.0000	10.00000	80	60	77/10/24	81/08/07
					TOT	157	42.11500	4249.400	65.18800	620	1	74/02/14	87/12/21
31673	FECSTREP	MFKFAGAR	/100ML	WATER		17	290.1200	113520.0	336.9300	1400	3	79/05/02	82/08/12
					J	3	82.66700	16329.00	127.7900	230	2	79/08/02	80/02/15

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21SC60WQ HQ 03050201002 0003.130 OFF
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	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
31673	FECSTREP	MFKFAGAR	/100ML	WATER	K	1	2.000000			2	2	79/08/02	79/08/02
					L	2	80.00000	.0000000	.0000000	80	80	80/11/06	80/11/06
					TOT	23	232.2600	94199.00	306.9200	1400	2	79/05/02	82/08/12
39300	P.P'DDT		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39301	P.P'DDT	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39305	D.P' DDT	WHL SMPL	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39306	D.P' DDT	MUD DRY	UG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39310	P.P'DDD		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39311	P.P'DDD	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39315	D.P' DDD	WHL SMPL	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39316	D.P' DDD	MUD DRY	UG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39320	P.P'DDE		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39321	P.P'DDE	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39327	O P DDE	WHL SMP	L UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39330	ALDRIN		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER		1	1.160000			1.16	1.16	81/05/14	81/05/14
					K	1	2.000000			2.00	2.00	82/05/07	82/05/07
					TOT	2	1.580000	.3528000	.5939700	2.00	1.16	81/05/14	82/05/07
39337	ALPHABHC		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39338	BETA BHC		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39380	DIELLRIN		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39383	DIELLRIN	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39390	ENDRIN		TOT UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39398	ETHION	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39399	ETHION	MUD	UG/KG	WATER	K	2	4.000000	.0000000	.0000000	4.00	4.00	81/05/14	82/05/07
39400	TOXAPHEN		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39410	HEPTCHLR		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39420	HPCHLREP		TOTUG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39480	MTHXYCLR	WHL SMPL	UG/L	WATER	K	1	.0500000			.050	.050	82/05/06	82/05/06
39516	PCBS	WHL SMPL	UG/L	WATER	K	5	.5000000	.0000000	.0000000	.500	.500	79/05/02	82/05/06
39519	PCBS	MUD	UG/KG	WATER	K	2	10.00000	.0000000	.0000000	10.00	10.00	81/05/14	82/05/07
39530	MALATHN	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39531	MALATHN	MUD	UG/KG	WATER	K	2	4.000000	.0000000	.0000000	4.00	4.00	81/05/14	82/05/07
39540	PARATHN	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39541	PARATHN	MUD	UG/KG	WATER	K	2	4.000000	.0000000	.0000000	4.00	4.00	81/05/14	82/05/07

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WANDO RVR BTWN RATHALL & HOBCAW CKS
45019 SOUTH CAROLINA CHARLESTON
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21SC60WQ HQ 03050201002 0003.130 OFF
0000 FEET DEPTH

TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39570	DIAZINON	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39571	DIAZINON	MUD	UG/KG	WATER	K	2	4.000000	.0000000	.0000000	4.00	4.00	81/05/14	82/05/07
39580	GUTHION	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39581	GUTHION	MUD DRY	UG/KG	WATER	K	2	4.000000	.0000000	.0000000	4.00	4.00	81/05/14	82/05/07
39610	PHOSDRIN	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39782	LINDANE	WHL SMPL	UG/L	WATER	K	5	.0500000	.0000000	.0000000	.050	.050	79/05/02	82/05/06
39783	LINDANE	MUD DRY	UG/KG	WATER	K	2	2.000000	.0000000	.0000000	2.00	2.00	81/05/14	82/05/07
39786	TRITHION	WHL SMPL	UG/L	WATER	K	5	.1000000	.0000000	.0000000	.100	.100	79/05/02	82/05/06
39787	TRITHION	MUD	UG/KG	WATER	K	2	4.000000	.0000000	.0000000	4.00	4.00	81/05/14	82/05/07
46570	CAL HARD	CA MG	MG/L	WATER	$	1	3514.300			3514	3514	86/05/12	86/05/12
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	7.000000			7.0	7.0	81/05/14	81/05/14
70507	PHOS-T	ORTHO	MG/L P	WATER		5	.0540000	.0023800	.0487850	.140	.020	75/12/12	79/07/27
					K	1	.0200000			.020	.020	76/02/10	76/02/10
					TOT	6	.0483330	.0020967	.0457890	.140	.020	75/12/12	79/07/27
71900	MERCURY	HG,TOTAL	UG/L	WATER		55	.8020000	.9095600	.9537100	5.2	.02	74/02/14	85/01/28
					K	34	.2617700	.0206150	.1435800	.8	.2	75/10/20	87/10/08
					TOT	89	.5956200	.6355500	.7972100	5.2	.02	74/02/14	87/10/08
71921	MERCURY	SEDMG/KG	DRY WGT	WATER		1	.2000000			.2	.2	81/05/14	81/05/14
					K	2	.2250000	.0012500	.0353560	.3	.2	79/05/02	82/05/07
					TOT	3	.2166700	.0008333	.0288680	.3	.2	79/05/02	82/05/07
74041	WQF	SAMPLE	UPDATED	WATER		200	867860.0	44599000	6678.200	880419	860529	84/08/06	87/12/21
82016	LEST.GRN	BAND 4	DIG.NO.	WATER		1	3.000000			3	3	83/02/24	83/02/24
82028	RATIO	FEC COL	FEC STRP	WATER	$	23	.7561900	1.519800	1.232800	6	.003	79/05/02	82/08/12
82048	BOT DPTH	OF SMPL	METERS	WATER		1073	4.917000	12.47700	3.532300	13.44	.10	74/05/21	87/12/21
82049	DEOXYGEN	ATION CO	NSTANT	WATER		1	9.000000			9.00	9.00	86/10/07	86/10/07

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32 47 40.0 079 53 00.0 3
SHEM CK AT US 17
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER MARINE
21SC60WQ HQ 03050201
0000 FEET DEPTH

TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	MSAMPLOC	% FROM	RT BANK	WATER		182	48.95600	30.39800	5.513400	50.0	10.0	74/01/08	87/12/21
00008	LAB	IDENT.	NUMBER	WATER		2	4.000000	.0000000	.0000000	4	4	74/01/08	74/01/08
00010	WATER	TEMP	CENT	WATER		343	19.92900	44.85000	6.697000	32.0	1.5	74/01/08	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	343	67.87000	145.3600	12.05700	89.6	34.7	74/01/08	87/12/21
00020	AIR	TEMP	CENT	WATER		113	21.80100	44.80200	6.693400	35.0	4.0	80/01/15	87/12/21
00041	WEATHER	WMO CODE	4501	WATER		116	1.103500	8.493600	2.914400	22	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		41	2787.800	891590.0	944.2400	4300	2000	84/01/30	87/12/21
00075	TURB	HLGE	PPM SIO2	WATER		2	4.500000	2.000000	1.414200	5.5	3.5	74/01/08	74/02/14
00076	TURB	TRBIDMTR	HACH FTU	WATER		147	8.681200	25.12300	5.012200	29.0	1.1	74/04/19	87/12/21
00080	COLOR	PT-CO	UNITS	WATER		19	24.73700	37.42800	6.117800	30	10	74/01/08	76/05/28
00300	DO		MG/L	WATER		347	6.639300	4.003800	2.001000	15.8	2.4	74/01/08	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	343	69.87200	239.0600	15.46200	136.2	30.4	74/01/08	87/12/21
00310	BOD	5 DAY	MG/L	WATER		150	2.334600	1.784600	1.335900	6.5	.4	74/01/08	87/12/21
					K	1	1.000000			1.0	1.0	78/12/15	78/12/15
					L	2	7.000000	.1799900	.4242600	7.3	6.7	76/05/28	77/04/28
					TOT	153	2.386900	2.046000	1.430400	7.3	.4	74/01/08	87/12/21
00340	COL	HI LEVEL	MG/L	WATER		5	160.2000	6263.200	79.14100	250	63	75/10/07	76/02/24
					L	1	912.0000			912	912	74/09/17	74/09/17
					TOT	6	285.5000	99211.00	314.9800	912	63	74/09/17	76/02/24
00400	PH		SU	WATER		147	7.587300	.1604800	.4006000	8.70	6.00	74/01/08	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		294	31557.00	60615000	7785.600	49000	1300	78/04/11	87/12/21
00403	PH	LAB	SU	WATER		156	7.569200	.0966990	.3109600	8.1	6.0	74/01/08	87/12/21
00410	T ALK	CACO3	MG/L	WATER		156	95.92600	660.1900	25.69400	332	32	74/01/08	87/12/21
00480	SALINITY		PPTH	WATER		300	22.46100	23.01900	4.797800	32.5	1.0	74/08/02	87/12/21
00610	NH3+NH4-	N TOTAL	MG/L	WATER		103	.3065000	.1691800	.4113200	2.600	.050	75/04/29	87/11/23
					K	18	.0494440	.0002526	.0158940	.100	.020	74/11/27	87/09/29
					TOT	121	.2682600	.1522800	.3902300	2.600	.020	74/11/27	87/11/23
00612	UN-IONZD	NH3-N	MG/L	WATER	$	98	.0055273	.0000681	.0082542	.051	.00008	76/03/24	87/11/23
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	98	.0067206	.0001007	.0100360	.061	.00009	76/03/24	87/11/23
00625	TOT KJEL	N	MG/L	WATER		114	.8578000	.5761300	.7590300	5.280	.120	74/11/27	87/11/23
					K	3	.1333300	.0033334	.0577350	.200	.100	75/04/29	80/07/23
					TOT	117	.8392300	.5745100	.7579700	5.280	.100	74/11/27	87/11/23
00630	NO2&NO3	N-TOTAL	MG/L	WATER		133	.0816540	.0030046	.0548150	.34	.02	74/01/08	87/10/26
					K	3	.0200000	.0000000	.0000000	.02	.02	81/02/20	87/11/23
					TOT	136	.0802940	.0030205	.0549590	.34	.02	74/01/08	87/11/23
00660	ORTHOPO4	PO4	MG/L	WATER		12	.2666700	.0347700	.1864700	.81	.12	74/01/08	75/04/29
00665	PHOS-TOT		MG/L P	WATER		108	.1251900	.0077016	.0877590	.560	.040	75/06/03	87/11/23
					K	13	.0846150	.0059936	.0774180	.300	.050	74/11/27	87/10/26
					TOT	121	.1208300	.0076258	.0873260	.560	.040	74/11/27	87/11/23

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45019 SOUTH CAROLINA CHARLESTON
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21SC60WQ HQ 03050201
0000 FEET DEPTH

TYPA/AMBNT/STREAM

PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00 80 T ORG C	C	MG/L	WATER		45	5.766700	14.47300	3.804430	19.0	1.9	76/01/16	87/10/26
				K	1	5.000000			5.0	5.0	78/11/06	78/11/06
				TOT	46	5.750000	14.16500	3.763610	19.0	1.9	76/01/16	87/10/26
00900 TOT HARD	CACO3	MG/L	WATER		5	3134.000	840780.0	916.9400	4100	1800	78/03/09	87/05/28
00916 CALCIUM	CA-TOT	MG/L	WATER		2	190.0000	9800.000	98.99500	260.0	120.0	85/02/25	86/05/12
00925 MGNSIUM	MG.DISS	MG/L	WATER		14	486.8900	61379.00	247.7530	800.0	.4	75/02/24	76/05/27
00927 MGNSIUM	MG.TOT	MG/L	WATER		3	683.3300	73734.00	271.5400	850.0	370.0	85/02/25	86/10/27
00940 CHLORIDE	TOTAL	MG/L	WATER		1	.5100000			.5	.5	74/05/21	74/05/21
01000 ARSENIC	AS.DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/27	74/11/27
01025 CADMIUM	CD.DISS	UG/L	WATER		3	42.66700	641.3400	25.32500	70	20	74/02/14	77/10/17
				K	18	11.11100	22.22200	4.714100	30	10	74/05/21	77/01/20
				TOT	21	15.61900	211.0500	14.52800	70	10	74/02/14	77/10/17
01027 CADMIUM	CD.TOT	UG/L	WATER		4	33.25000	462.2500	21.50000	53	10	77/07/15	79/01/31
				K	29	10.00000	.0000000	.0000000	10	10	78/04/11	87/10/26
				TOT	33	12.81800	102.7200	10.13500	53	10	77/07/15	87/10/26
01030 CHROMIUM	CR.DISS	UG/L	WATER		4	50.00000	.0000000	.0000000	50	50	76/02/04	76/04/23
				K	17	52.94100	147.0600	12.12700	100	50	74/02/14	77/10/17
				TOT	21	52.38100	119.0500	10.91100	100	50	74/02/14	77/10/17
01034 CHROMIUM	CR.TOT	UG/L	WATER		2	60.00000	200.0000	14.14200	70	50	81/04/23	83/10/14
				K	31	50.00000	.0000000	.0000000	50	50	77/07/15	87/10/26
				TOT	33	50.60600	12.12300	3.481800	70	50	77/07/15	87/10/26
01040 COPPER	CU.DISS	UG/L	WATER		7	140.0000	4733.300	68.79900	290	100	74/07/12	77/10/17
				K	20	97.50000	125.0000	11.18030	100	50	74/02/14	77/01/20
				TOT	27	108.5200	1543.900	39.29200	290	50	74/02/14	77/10/17
01042 COPPER	CU.TOT	UG/L	WATER		7	61.42900	347.6200	18.64500	100	50	77/07/15	86/10/27
				K	32	65.62500	554.4400	23.54700	100	50	78/01/20	87/10/26
				TOT	39	64.87200	509.8600	22.58000	100	50	77/07/15	87/10/26
01045 IRON	FE.TOT	UG/L	WATER		39	527.9500	30328.00	174.1500	900	160	77/07/15	87/10/26
01046 IRON	FE.DISS	UG/L	WATER		24	550.0400	49590.00	222.6900	1100	100	74/05/21	77/10/17
				K	3	100.0000	.0000000	.0000000	100	100	74/02/14	76/02/04
				TOT	27	500.0400	64641.00	254.2500	1100	100	74/02/14	77/10/17
01049 LEAD	PB.DISS	UG/L	WATER		21	234.4300	8551.000	92.47100	420	78	74/05/21	77/10/17
				K	6	75.00000	3750.000	61.23700	200	50	74/02/14	75/06/03
				TOT	27	199.0000	11861.00	108.9100	420	50	74/02/14	77/10/17
01051 LEAD	PB.TOT	UG/L	WATER		25	379.6000	14204.00	119.1800	640	170	77/07/15	84/04/16
				K	8	50.00000	.0000000	.0000000	50	50	80/02/14	87/10/26
				TOT	33	299.7000	31228.00	176.7200	640	50	77/07/15	87/10/26
01055 MANGNESE	MN	UG/L	WATER		25	94.80000	3784.300	61.51700	270.0	50.0	77/07/15	87/07/23
				K	14	50.00000	.0000000	.0000000	50.0	50.0	78/04/11	87/10/26

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'TYPE/AMENT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01055	MANGANESE	MN	UG/L	WATER	TOT	39	78.71800	2864.100	53.51700	270.0	50.0	77/07/15	87/10/26
01056	MANGANESE	MN,DISS	UG/L	WATER		14	82.14300	725.8300	26.94100	140.0	50.0	75/02/24	77/10/17
					K	5	50.00000	.0000000	.0000000	50.0	50.0	75/04/29	77/01/20
					TOT	19	73.68400	735.6800	27.12300	140.0	50.0	75/02/24	77/10/17
01065	NICKEL	NI,DISS	UG/L	WATER		15	192.6700	7092.400	84.21610	380	100	75/02/24	77/10/17
					K	3	100.0000	.0000000	.0000000	100	100	75/03/27	76/07/15
					TOT	18	177.2200	7103.600	84.28300	380	100	75/02/24	77/10/17
01067	NICKEL	NI,TOTAL	UG/L	WATER		27	202.5900	9943.100	99.71530	420	50	77/07/15	85/10/21
					K	12	54.16700	208.3400	14.43400	100	50	78/01/20	87/10/26
					TOT	39	156.9200	11680.00	108.0700	420	50	77/07/15	87/10/26
01090	ZINC	ZN,DISS	UG/L	WATER		5	118.0000	620.0000	24.90000	150	100	75/02/24	77/04/28
					K	15	100.0000	.0000000	.0000000	100	100	74/11/27	77/10/17
					TOT	20	104.5000	194.4700	13.94500	150	100	74/11/27	77/10/17
01092	ZINC	ZN,TOT	UG/L	WATER		24	137.9200	8939.000	94.54610	500	50	77/07/15	87/07/23
					K	15	60.00000	428.5700	20.70200	100	50	78/01/20	87/10/26
					TOT	39	107.9500	7043.100	83.92300	500	50	77/07/15	87/10/26
31505	TOT COLI	MPN CONF	/100ML	WATER		1	540.0000			540	540	86/10/27	86/10/27
31615	FEC COLI	MPNECMED	/100ML	WATER		1	540.0000			540	540	86/10/27	86/10/27
31616	FEC COLI	MFM-FCBR	/100ML	WATER		105	145.5200	23365.00	152.8600	830	9	74/01/08	87/12/21
					J	42	264.4300	283300.0	532.2600	2500	4	76/09/21	87/10/26
					L	5	456.0000	38880.00	197.1800	600	240	76/09/15	86/08/15
					TOT	152	188.5900	99302.00	315.1200	2500	4	74/01/08	87/12/21
46570	CAL HARD	CA MG	MG/L	WATER	$	2	2986.400	2705700	1644.900	4150	1823	85/02/25	86/05/12
70507	PHOS-T	ORTHO	MG/L P	WATER		7	.0500000	.0008666	.0294390	.100	.020	75/06/03	76/04/23
71900	MERCURY	HG,TOTAL	UG/L	WATER		43	.8674400	.7855700	.8863200	4.0	.2	74/02/14	84/07/06
					K	21	.3285700	.0321430	.1792900	.8	.2	75/04/29	87/10/26
					TOT	64	.6906200	.5989500	.7739200	4.0	.2	74/02/14	87/10/26
74041	WQF	SAMPLE	UPDATED	WATER		70	868260.0	40363000	6353.200	880419	860529	84/07/06	87/12/21
82048	BOT DPTH	OF SMPL	METERS	WATER		336	1.443500	1.865100	1.365700	7.00	.03	74/01/08	87/12/21

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21SC60WQ HQ 03050202003 0032.350 OFF
0000 FEET DEPTH

TYPA/AMENT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		207	48.21700	70.60000	8.402400	50.0	1.0	74/02/14	87/12/21
00010	WATER	TEMP	CENT	WATER		432	19.70400	46.75200	6.837500	30.5	2.6	74/04/19	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	432	67.46400	151.4800	12.30800	86.9	36.7	74/04/19	87/12/21
00020	AIR	TEMP	CENT	WATER		140	20.76400	45.53400	6.747900	34.0	4.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		2	23.00000	2.000000	1.414200	24.0	22.0	81/02/20	81/03/31
00041	WEATHER	WMO CODE	4501	WATER		141	.8368800	3.994600	1.998700	22	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		49	3455.100	34040000	5834.400	43000	2000	81/03/31	87/12/21
00075	TURB	HLGE	PPM SI02	WATER		1	5.500000			5.5	5.5	74/02/14	74/02/14
00076	TURB	TRBIDMTR	HACH FTU	WATER		137	7.297400	24.57400	4.957200	29.0	1.1	74/04/19	87/12/21
00080	COLLR	PT-CO	UNITS	WATER		16	25.66700	45.95300	6.778900	35	10	74/02/14	76/06/07
00300	DO		MG/L	WATER		437	7.035900	3.129000	1.768900	14.0	3.0	74/04/19	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	431	74.10300	151.2300	12.29800	122.2	38.0	74/04/19	87/12/21
00310	BOD	5 DAY	MG/L	WATER		138	1.768500	1.012300	1.006100	6.6	.5	74/02/14	87/12/21
					K	5	1.000000	.0000000	.0000000	1.0	1.0	76/03/25	84/10/29
					TOT	143	1.741600	.9967200	.9983600	6.6	.5	74/02/14	87/12/21
00340	COD	HI LEVEL	MG/L	WATER		8	276.0000	37136.00	192.7100	616	52	74/09/17	78/04/11
00400	PH		SU	WATER		142	7.765100	.1327900	.3644000	8.90	6.30	74/04/19	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		396	34001.00	67909000	8240.700	50000	37	78/04/11	87/12/21
					L	1	50000.00			50000	50000	79/08/09	79/08/09
					TOT	397	34042.00	68382000	8269.400	50000	37	78/04/11	87/12/21
00403	PH	LAB	SU	WATER		144	7.727400	.0927120	.3044900	8.2	6.4	74/02/14	87/12/21
00410	T ALK	CACO3	MG/L	WATER		144	90.87400	395.7100	19.89200	170	34	74/02/14	87/12/21
00480	SALINITY		PPTH	WATER		402	24.69600	23.78800	4.877300	36.0	9.0	74/08/02	87/12/21
00482	ELEVTION	TOP.CONT	ZONE.FT.	WATER		1	27.50000			27.50	27.50	82/06/24	82/06/24
00610	NH3+NH4-	N TOTAL	MG/L	WATER		103	.2465000	.0974310	.3121400	2.200	.040	75/06/03	87/11/23
					K	16	.0531250	.0001562	.0125000	.100	.050	75/08/06	87/12/21
					TOT	119	.2205000	.0886290	.2977100	2.200	.040	75/06/03	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	96	.0070473	.0002533	.0159170	.147	.0001	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	96	.0085687	.0003745	.0193540	.179	.0001	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		110	.6341800	.2380000	.4878500	3.800	.100	75/06/03	87/12/21
					K	4	.1000000	.0000000	.0000000	.100	.100	80/01/15	86/05/12
					TOT	114	.6154300	.2393200	.4892100	3.800	.100	75/06/03	87/12/21
00630	NO2&NO3	N-TOTAL	MG/L	WATER		127	.0972440	.0125470	.1120100	.81	.01	74/02/14	87/12/21
					K	4	.0200000	.0000000	.0000000	.02	.02	82/02/26	87/11/23
					TOT	131	.0948850	.0123390	.1110800	.81	.01	74/02/14	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		6	.3450000	.0407500	.2018700	.75	.22	74/02/14	74/10/16
00665	PHOS-TOT		MG/L P	WATER		101	.1088100	.0064864	.0805380	.540	.020	75/06/03	87/12/21
					K	18	.0488890	.0000222	.0047143	.050	.030	75/11/07	87/11/23
					TOT	119	.0997480	.0059650	.0772340	.540	.020	75/06/03	87/12/21

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ABANDONED HIGHWAY BRIDGE PITT ST
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21SC60WQ HQ 03050202003 0032.350 OFF
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TYPE/AMBNT/STREAM

PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
006 0 T ORG C	C	MG/L	WATER		44	4.431800	8.520300	2.919000	18.9	1.1	76/01/23	87/10/26
				K	1	2.000000			2.0	2.0	78/04/11	78/04/11
				TOT	45	4.377800	8.458100	2.908300	18.9	1.1	76/01/23	87/10/26
00900 TOT HARD	CACO3	MG/L	WATER		5	3092.000	1364100	1163.700	4500	1700	78/03/09	87/05/28
00916 CALCIUM	CA-TOT	MG/L	WATER		2	180.0000	9800.000	98.99500	250.0	110.0	85/02/25	86/05/12
00925 MGNSIUM	MG,DISS	MG/L	WATER		9	485.4500	17533.00	132.4100	623.0	184.0	75/06/03	76/06/07
00927 MGNSIUM	MG,TOT	MG/L	WATER		2	575.0000	110450.0	332.3400	810.0	340.0	85/02/25	86/05/12
01025 CADMIUM	CD,DISS	UG/L	WATER		2	40.00000	200.0000	14.14200	50	30	74/02/14	77/08/25
				K	13	11.63900	30.76900	5.547000	30	10	74/05/21	77/04/28
				TOT	15	15.33300	140.9500	11.87200	50	10	74/02/14	77/08/25
01027 CADMIUM	CD,TOT	UG/L	WATER		2	40.50000	1404.500	37.47700	67	14	78/01/20	78/07/21
				K	31	10.00000	.0000000	.0000000	10	10	78/04/11	87/10/26
				TOT	33	11.84900	98.50800	9.925100	67	10	78/01/20	87/10/26
01030 CHROMIUM	CR,DISS	UG/L	WATER		2	85.00000	450.0000	21.21300	100	70	76/02/10	76/03/25
				K	13	53.84600	192.3100	13.86800	100	50	74/02/14	77/08/25
				TOT	15	58.00000	317.1400	17.80900	100	50	74/02/14	77/08/25
01034 CHROMIUM	CR,TOT	UG/L	WATER		2	50.00000	.0000000	.0000000	50	50	78/07/21	83/10/14
				K	31	50.00000	.0000000	.0000000	50	50	78/01/20	87/10/26
				TOT	33	50.00000	.0000000	.0000000	50	50	78/01/20	87/10/26
01040 COPPER	CU,DISS	UG/L	WATER		3	116.6700	433.3500	20.81700	140	100	74/07/12	77/08/25
				K	17	97.05900	147.0600	12.12700	100	50	74/02/14	77/04/28
				TOT	20	100.0000	221.0500	14.86800	140	50	74/02/14	77/08/25
01042 COPPER	CU,TOT	UG/L	WATER		4	67.50000	558.3300	23.62900	100	50	79/07/27	83/10/14
				K	35	64.28600	525.2100	22.91800	100	50	78/01/20	87/10/26
				TOT	39	64.61500	514.9800	22.69300	100	50	78/01/20	87/10/26
01045 IRON	FE,TOT	UG/L	WATER		39	516.4100	62282.00	249.5600	1200	260	78/01/20	87/10/26
01046 IRON	FE,DISS	UG/L	WATER		18	509.5000	84290.00	290.3300	1280	210	74/05/21	77/08/25
				K	2	100.0000	.0000000	.0000000	100	100	74/02/14	75/11/07
				TOT	20	468.5500	91304.00	302.1700	1280	100	74/02/14	77/08/25
01049 LEAD	PB,DISS	UG/L	WATER		18	201.8300	6444.000	80.27500	380	65	74/05/21	77/08/25
				K	2	125.0000	11250.00	106.0700	200	50	74/02/14	75/06/03
				TOT	20	194.1500	6917.100	83.16900	380	50	74/02/14	77/08/25
01051 LEAD	PB,TOT	UG/L	WATER		25	382.4000	20561.00	143.3900	660	50	78/01/20	84/04/16
				K	8	50.00000	.0000000	.0000000	50	50	86/02/14	87/10/26
				TOT	33	301.8200	36347.00	190.6500	660	50	78/01/20	87/10/26
01055 MANGNESE	MN	UG/L	WATER		17	72.35300	356.6200	18.88500	120.0	50.0	78/01/20	87/07/23
				K	22	50.00000	.0000000	.0000000	50.0	50.0	79/01/30	87/10/26
				TOT	39	59.74400	276.2500	16.62100	120.0	50.0	78/01/20	87/10/26
01056 MANGNESE	MN,DISS	UG/L	WATER		8	141.2500	28755.00	169.5800	550.0	50.0	75/06/03	77/08/25

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ABANDONED HIGHWAY BRIDGE PITT ST
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER MARINE
21SC60WQ HQ 03050202003 0032.350 OFF
0000 FEET DEPTH

TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01056	MANGNESE	MN.DISS	UG/L	WATER	K	5	50.00000	.0000000	.0000000	50.0	50.0	75/11/07	76/02/26
01056	MANGNESE	MN.DISS	UG/L	WATER	TOT	13	106.1500	18909.00	137.5100	550.0	50.0	75/06/03	77/08/25
01065	NICKEL	NI.DISS	UG/L	WATER		10	173.0000	2267.800	47.62100	260	110	75/06/03	77/08/25
					K	3	100.0000	.0000000	.0000000	100	100	75/10/07	76/02/26
					TOT	13	156.1500	2725.700	52.20800	260	100	75/06/03	77/08/25
01067	NICKEL	NI.TOTAL	UG/L	WATER		28	192.5000	9523.200	97.58700	440	50	76/04/11	85/10/21
					K	11	54.64600	227.2800	15.07600	100	50	78/01/20	87/10/26
					TOT	39	153.5900	10782.00	103.8430	440	50	78/01/20	87/10/26
01090	ZINC	ZN.DISS	UG/L	WATER		3	100.0000	.0000000	.0000000	100	100	76/03/25	77/04/28
					K	10	100.0000	.0000000	.0000000	100	100	75/06/03	77/08/25
					TOT	13	100.0000	.0000000	.0000000	100	100	75/06/03	77/08/25
01092	ZINC	ZN.TOT	UG/L	WATER		18	96.11100	1554.600	39.42800	200	50	76/07/21	86/06/12
					K	21	66.66700	583.3400	24.15200	100	50	78/01/20	87/10/26
					TOT	39	80.25700	1223.600	34.98000	200	50	78/01/20	87/10/26
31506	TOT COLI	MPN CONF	TUBECODE	WATER		2	634.0000	163590.0	404.4700	920	348	79/08/09	79/10/01
31615	FEC COLI	MPNECMED	/100ML	WATER		2	294.0000	5832.000	76.36800	348	240	79/08/09	79/10/01
31616	FEC COLI	MFM-FCBR	/100ML	WATER		98	54.34700	3498.700	59.14900	310	1	74/02/14	87/12/21
					J	39	53.35900	9627.300	98.11900	420	2	76/09/09	87/10/26
					K	2	3.500000	.5000000	.7071100	4	3	76/01/23	86/10/07
					L	2	90.00000	1800.000	42.42700	120	60	78/01/20	79/06/19
					TOT	141	53.85800	5105.200	71.45100	420	1	74/02/14	87/12/21
40570	CAL HARD	CA MG	MG/L	WATER	$	2	2817.300	2510700	1615.800	3960	1675	85/02/25	86/05/12
70507	PHOS-T	ORTHO	MG/L P	WATER		9	.0822220	.0102450	.1012200	.300	.020	75/06/03	79/07/27
					K	1	.0200000			.020	.020	76/03/25	76/03/25
					TOT	10	.0760000	.0094933	.0974340	.300	.020	75/06/03	79/07/27
71900	MERCURY	HG.TOTAL	UG/L	WATER		33	1.177300	2.124700	1.457730	6.9	.2	74/02/14	85/07/05
					K	22	.2954600	.0290260	.1703700	.8	.2	75/10/07	87/10/26
					TOT	55	.8245400	1.460500	1.208530	6.9	.2	74/02/14	87/10/26
74041	WDF	SAMPLE	UPDATED	WATER		86	867710.0	38884000	6235.700	880419	860529	84/07/06	87/12/21
82048	DUT DPTH	OF SMPL	METERS	WATER		432	2.212000	4.328000	2.080400	11.00	.30	74/04/19	87/12/21

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CHIN HARBOR AT FT JOHNSON
45019 SOUTH CAROLINA CHARLESTON
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0000 FEET DEPTH

TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	MSAMPLOC	% FROM	RT BANK	WATER		303	48.14400	70.19700	8.378400	50.0	1.0	74/03/07	87/12/21
00010	WATER	TEMP	CENT	WATER		820	19.49800	49.50000	7.035600	31.0	2.4	74/04/23	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	820	67.09300	160.2900	12.66000	87.8	36.3	74/04/23	87/12/21
00020	AIR	TEMP	CENT	WATER		208	19.81700	44.55200	6.674700	37.5	4.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		2	24.50000	4.500000	2.121300	26.0	23.0	81/03/31	81/05/28
00041	WEATHER	WMO CODE	4501	WATER		209	.6698600	.7991400	.8939400	2	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		54	3300.000	29524000	5433.600	42000	2000	81/03/31	87/12/21
00075	TURB	HLGE	PPM SIO2	WATER		1	9.000000			9.0	9.0	74/03/07	74/03/07
00076	TURB	TRBIDMTR	HACH FTU	WATER		134	6.868600	38.15000	6.176610	60.0	.5	74/05/29	87/12/21
00080	COLOR	PT-CO	UNITS	WATER		14	22.14300	33.51700	5.789400	30	10	74/03/07	76/03/25
00300	DO		MG/L	WATER		829	7.269900	3.575200	1.890800	12.0	3.0	74/04/23	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	819	75.87200	154.1300	12.41500	117.3	25.2	74/04/23	87/12/21
0030	BOD	4 DAY	MG/L	WATER		1	1.900000			1.9	1.9	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		137	1.728700	.9113500	.9546500	6.4	.5	74/04/23	87/12/21
					K	2	.5500000	.4050000	.6364000	1.0	.1	83/01/24	84/08/23
					L	1	7.150000			7.2	7.2	76/07/22	76/07/22
					TOT	140	1.750600	1.125600	1.060900	7.2	.1	74/04/23	87/12/21
00312	BOD	6 DAY	MG/L	WATER		1	2.900000			2.9	2.9	74/03/07	74/03/07
00322	BOD	10 DAY	MG/L	WATER		1	1.400000			1.4	1.4	78/11/24	78/11/24
00339	COD MUD	DRY WGT	MG/KG	WATER		1	96000.00			96000	96000	75/12/05	75/12/05
00340	COD	HI LEVEL	MG/L	WATER		5	262.6000	42519.00	206.2000	600	95	74/09/19	76/03/25
00400	PH		SU	WATER		140	7.796000	.1213500	.3483500	8.70	6.60	74/04/23	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		795	32897.00	89111000	9386.700	50000	3400	78/04/03	87/12/21
00403	PH	LAB	SU	WATER		144	7.686000	.1129800	.3361300	8.1	5.4	74/03/07	87/12/21
00410	T ALK	CACO3	MG/L	WATER		143	79.57800	404.1700	20.10400	150	8	74/03/07	87/12/21
00480	SALINITY		PPTH	WATER		801	23.96000	40.13700	6.335400	39.5	7.5	74/09/19	87/12/21
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		1	120.0000			120.000	120.000	75/12/05	75/12/05
00610	NH3+NH4-	N TOTAL	MG/L	WATER		104	.2605700	.1391300	.3730000	2.700	.050	75/04/08	87/11/24
					K	16	.0475000	.0003400	.0184390	.100	.020	74/11/25	87/12/21
					TOT	120	.2321600	.1257600	.3546200	2.700	.020	74/11/25	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	99	.0067428	.0000953	.0097662	.082	.00008	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	99	.0081985	.0001410	.0118750	.099	.00009	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		114	.6720100	.2836300	.5325700	4.400	.100	75/01/27	87/12/21
					K	6	.0850000	.0010300	.0320940	.120	.040	74/11/25	84/12/04
					TOT	120	.6426600	.2858800	.5346800	4.400	.040	74/11/25	87/12/21
00630	NO2&NO3	N-TOTAL	MG/L	WATER		130	.1506900	.3385400	.5818410	6.65	.02	74/03/07	87/12/21
					K	2	.0200000	.0000000	.0000000	.02	.02	82/11/19	85/01/02
					TOT	132	.1487100	.3336200	.5776010	6.65	.02	74/03/07	87/12/21
00660	OR1HOPO4	PO4	MG/L	WATER		9	.1866700	.0037751	.0614420	.24	.09	74/03/07	75/04/08

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45019 SOUTH CAROLINA CHARLESTON
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0000 FEET DEPTH

TYPA/AMBNT/STREAM

PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00665 PHOS-TOT		MG/L P	WATER		89	.1092100	.0265850	.1630500	1.490	.030	76/01/23	87/09/29
				K	31	.0570960	.0020613	.0454020	.300	.020	74/11/25	87/12/21
				TOT	120	.0957500	.0207040	.1438900	1.490	.020	74/11/25	87/12/21
00680 T ORG C	C	MG/L	WATER		45	4.872900	3.576900	1.891300	9.8	1.8	74/11/25	87/10/26
				K	2	5.000000	.0000000	.0000000	5.0	5.0	78/01/20	78/11/24
				TOT	47	4.878300	3.422000	1.849900	9.8	1.8	74/11/25	87/10/26
00900 TOT HARD	CACO3	MG/L	WATER		5	3402.000	497020.0	705.0000	4100	2500	78/03/09	87/05/28
00910 CALCIUM	CACO3	MG/L	WATER	K	1	.0500000			.05	.05	83/09/08	83/09/08
00916 CALCIUM	CA-TOT	MG/L	WATER		2	255.0000	450.0000	21.21300	270.0	240.0	85/02/01	86/05/12
00925 MGNSIUM	MG.DISS	MG/L	WATER		9	374.5600	21679.00	147.2400	601.0	218.0	76/03/12	76/03/25
00927 MGNSIUM	MG.TOT	MG/L	WATER		2	810.0000	800.0000	28.28400	830.0	790.0	85/02/01	86/05/12
01000 ARSENIC	AS.DISS	UG/L	WATER	K	1	5.000000			5	5	74/11/25	74/11/25
01025 CADMIUM	CD.DISS	UG/L	WATER		1	30.00000			30	30	77/08/25	77/08/25
				K	13	16.92300	623.0800	24.96200	100	10	74/03/07	77/04/25
				TOT	14	17.85700	587.3600	24.23600	100	10	74/03/07	77/08/25
01027 CADMIUM	CD.TOT	UG/L	WATER		2	26.00000	128.0000	11.31400	34	18	78/01/20	78/07/13
				K	32	10.00000	.0000000	.0000000	10	10	78/04/03	87/10/26
				TOT	34	10.94100	18.48100	4.299000	34	10	78/01/20	87/10/26
01028 CD MUD	DRY WGT	MG/KG-CD	WATER	K	1	.9000000			.90	.90	75/12/05	75/12/05
01029 CHROMIUM	SEDMG/KG	DRY WGT	WATER		1	24.50000			24.50	24.50	75/12/05	75/12/05
01030 CHROMIUM	CR.DISS	UG/L	WATER		1	80.00000			80	80	76/03/25	76/03/25
				K	13	53.84600	192.3100	13.86800	100	50	74/03/07	77/08/25
				TOT	14	55.71400	226.3800	15.04600	100	50	74/03/07	77/08/25
01034 CHROMIUM	CR.TOT	UG/L	WATER	K	34	50.00000	.0000000	.0000000	50	50	78/01/20	87/10/26
01040 COPPER	CU.DISS	UG/L	WATER		4	494.2500	498190.0	705.8200	1550	100	74/03/07	75/04/08
				K	15	100.0000	.0000000	.0000000	100	100	74/07/24	77/08/25
				TOT	19	183.0000	110300.0	332.1200	1550	100	74/03/07	77/08/25
01042 COPPER	CU.TOT	UG/L	WATER		3	56.66700	33.33600	5.773700	60	50	81/10/27	83/10/14
				K	37	66.21600	563.0700	23.72900	100	50	76/01/20	87/10/26
				TOT	40	65.60000	527.9500	22.97700	100	50	78/01/20	87/10/26
01043 COPPER	SEDMG/KG	DRY WGT	WATER	K	1	8.200000			8.20	8.20	75/12/05	75/12/05
01045 IRON	FE.TOT	UG/L	WATER		40	427.0000	52006.00	228.0500	1500	150	78/01/20	87/10/26
01046 IRON	FE.DISS	UG/L	WATER		19	492.5300	359630.0	599.6900	2900	160	74/03/07	77/08/25
01049 LEAD	PB.DISS	UG/L	WATER		15	160.0000	4000.000	63.24600	290	80	74/07/24	77/08/25
				K	4	87.50000	5625.000	75.00000	200	50	74/03/07	75/04/08
				TOT	19	144.7400	4970.600	70.50400	290	50	74/03/07	77/08/25
01051 LEAD	PB.TOT	UG/L	WATER		26	298.0800	12552.00	112.0400	490	130	78/01/20	84/04/16
				K	8	50.00000	.0000000	.0000000	50	50	86/02/14	87/10/26
				TOT	34	239.7100	20918.00	144.6300	490	50	78/01/20	87/10/26

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TYPA/AMBNT/STREAM

	PARAMETER		MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01052	LEAD	SEDMG/KG DRY WGT	WATER		1	34.20000			34.20	34.20	75/12/05	75/12/05
01053	MN MUD	DRY WGT MG/KG-MN	WATER		1	612.0000			612.00	612.00	75/12/05	75/12/05
01055	MANGNESE	MN UG/L	WATER		13	86.15400	3459.000	58.81300	260.0	50.0	78/01/20	85/07/05
				K	27	50.00000	.0000000	.0000000	50.0	50.0	78/04/03	87/10/26
				TOT	40	61.75000	1358.400	36.85700	260.0	50.0	78/01/20	87/10/26
01056	MANGNESE	MN.DISS UG/L	WATER		3	446.6700	426030.0	652.7100	1200.0	50.0	75/04/08	76/03/25
				K	9	50.00000	.0000000	.0000000	50.0	50.0	75/03/12	77/08/25
				TOT	12	149.1700	109650.0	331.1300	1200.0	50.0	75/03/12	77/08/25
01065	NICKEL	NI.DISS UG/L	WATER		10	128.0000	862.2200	29.36400	180	100	75/03/12	77/08/25
				K	2	100.0000	.0000000	.0000000	100	100	75/07/29	75/10/20
				TOT	12	123.3300	824.2500	28.71000	180	100	75/03/12	77/08/25
01067	NICKEL	NI.TOTAL UG/L	WATER		27	157.4100	6266.100	79.15900	360	50	78/04/03	85/10/21
				K	13	57.69200	352.5700	18.77700	100	50	78/01/20	87/10/26
				TOT	40	125.0000	6523.100	80.76600	360	50	78/01/20	87/10/26
01068	NICKEL	SEDMG/KG DRY WGT	WATER		1	9.800000			9.80	9.80	75/12/05	75/12/05
01090	ZINC	ZN.DISS UG/L	WATER		2	225.0000	31250.00	176.7800	350	100	75/04/08	76/03/25
				K	11	100.0000	.0000000	.0000000	100	100	74/11/25	77/08/25
				TOT	13	119.2300	4807.700	69.33800	350	100	74/11/25	77/08/25
01092	ZINC	ZN.TOT UG/L	WATER		17	104.7700	4101.000	64.03900	260	1	79/01/18	86/06/12
				K	23	65.21700	553.3600	23.52400	100	50	78/01/20	87/10/26
				TOT	40	82.02500	2386.600	48.85300	260	1	78/01/20	87/10/26
01093	ZINC	SEDMG/KG DRY WGT	WATER		1	72.50000			72.50	72.50	75/12/05	75/12/05
31616	FEC COLI	MFM-FCBR /100ML	WATER		103	91.22300	10848.00	104.1500	640	2	74/03/07	87/12/21
				J	37	100.9700	23784.00	154.2200	650	4	76/10/26	87/09/29
				K	1	4.000000			4	4	86/10/07	86/10/07
				L	2	360.0000	115200.0	339.4100	600	120	82/02/26	86/08/15
				TOT	143	96.89500	15696.00	125.2900	650	2	74/03/07	87/12/21
39301	P,P'DDT	SEDUG/KG DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39306	O,P' DDT	MUD DRY UG/KG	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39311	P,P'DDD	SEDUG/KG DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39316	O,P' DDD	MUD DRY UG/KG	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39321	P,P'DDE	SEDUG/KG DRY WGT	WATER		1	.6600000			.66	.66	75/12/05	75/12/05
39333	ALDRIN	SEDUG/KG DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39343	GBHC-MUD	LINDANE DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39363	DDE	MUD UG/KG	WATER		1	3.670000			3.67	3.67	74/03/19	74/03/19
39368	DDE	MUD UG/KG	WATER		1	1.720000			1.72	1.72	74/03/19	74/03/19
39373	DDT	MUD UG/KG	WATER		1	2.620000			2.62	2.62	74/03/19	74/03/19
39383	DIELDRIN	SEDUG/KG DRY WGT	WATER		1	2.450000			2.45	2.45	74/03/19	74/03/19
				K	1	.1000000			.10	.10	75/12/05	75/12/05

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32 45 30.0 079 54 00.0 3
CHIN HARBOR AT FT JOHNSON
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030814
SANTEE COOPER
21SC60WQ HQ 03050202017 0003.140 OFF
0000 FEET DEPTH

TYPA/AMBNT/STREAM

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	TOT	2	1.275000	2.761300	1.661700	2.45	.10	74/03/19	75/12/05
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39399	ETHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/12/05	75/12/05
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39531	MALATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/12/05	75/12/05
39541	PARATHN	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/12/05	75/12/05
39571	DIAZINON	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/12/05	75/12/05
39581	GUTHION	MUD DRY	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/12/05	75/12/05
39783	LINDANE	MUD DRY	UG/KG	WATER	K	1	.1000000			.10	.10	75/12/05	75/12/05
39787	TRITHION	MUD	UG/KG	WATER	K	1	1.000000			1.00	1.00	75/12/05	75/12/05
46570	CAL HARD	CA MG	MG/L	WATER	$	2	3972.300	28736.00	169.5200	4092	3853	86/02/01	86/05/12
70320	MOISTURE	CONTENT	PERCENT	WATER		1	80.00000			80	80	75/12/05	75/12/05
70322	RESIDUE	TOT VOL	PERCENT	WATER		1	15.00000			15.0	15.0	75/12/05	75/12/05
70507	PHOS-T	ORTHO	MG/L P	WATER		6	.0666670	.0058667	.0765940	.220	.020	75/07/29	79/07/27
71900	MERCURY	HG.TOTAL	UG/L	WATER		38	1.104000	1.830700	1.353000	7.3	.2	74/03/07	85/10/21
					K	19	.2631600	.0257900	.1605900	.8	.2	75/07/29	87/10/26
					TOT	57	.8236800	1.377700	1.173800	7.3	.2	74/03/07	87/10/26
74041	WQF	SAMPLE	UPDATED	WATER		195	868130.0	36408000	6033.900	880419	860529	84/08/06	87/12/21
80153	SEDIMENT	ORG-C	PERCENT	WATER		1	2.400000			2.40	2.40	75/12/05	75/12/05
82048	BOT DPTH	OF SMPL	METERS	WATER		823	4.602300	11.56400	3.400600	14.00	.30	74/04/23	87/12/21

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32 45 50.0 079 53 10.0 3
S CHAN CHTN HBR AT BELL BUOY 28
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030802
SANTEE-COOPER RIVER BASIN
21SC60WQ 03050202
0000 FEET DEPTH

TYPA/AMBNT/ESTURY/SOLIDS/BIO

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00002	HSAMPLOC	% FROM	RT BANK	WATER		292	50.69900	95.47700	9.771200	99.0	5.0	74/03/07	87/12/21
00010	WATER	TEMP	CENT	WATER		792	19.79900	48.15700	6.939500	33.0	7.0	74/05/29	87/12/21
00011	WATER	TEMP	FAHN	WATER	$	792	67.63600	155.9700	12.48900	91.4	44.6	74/05/29	87/12/21
00020	AIR	TEMP	CENT	WATER		189	19.25700	53.26000	7.298000	34.5	6.0	80/01/15	87/12/21
00021	AIR	TEMP	FAHN	WATER		2	26.00000	18.00000	4.242600	29.0	23.0	81/03/31	81/05/19
00041	WEATHER	WMO CODE	4501	WATER		189	.7619100	.8100300	.9000200	2	0	80/01/15	87/12/21
00067	TIDE	STAGE	CODE	WATER		53	2694.300	890150.0	943.4800	4300	2000	81/03/31	87/12/21
00076	TURB	TRBIDMTR	HACH FTU	WATER		132	6.875700	37.68800	6.139000	44.0	1.4	74/03/07	87/12/21
00077	TRANSP	SECCHI	INCHES	WATER		23	25.16300	581.6400	24.11700	63	.5	77/08/25	85/06/24
00078	TRANSP	SECCHI	METERS	WATER		35	1.035100	.1551500	.3938900	2.00	.30	79/03/12	87/04/13
					J	1	1.300000			1.30	1.30	82/09/28	82/09/28
					M	4	1.200000	.1800000	.4242700	1.70	.80	83/06/13	86/09/11
					TOT	40	1.058200	.1531500	.3913400	2.00	.30	79/03/12	87/04/13
00080	COLOR	PT-CO	UNITS	WATER		17	22.48200	74.00600	8.602700	30	5	74/03/07	81/12/30
00300	DO		MG/L	WATER		801	7.277200	3.636200	1.906900	14.6	2.4	74/05/29	87/12/21
00301	DO	SATUR	PERCENT	WATER	$	791	76.52600	168.2400	12.97100	134.1	31.6	74/05/29	87/12/21
00306	BOD	4 DAY	MG/L	WATER		1	2.400000			2.4	2.4	75/04/08	75/04/08
00310	BOD	5 DAY	MG/L	WATER		133	1.801500	.8525300	.9233300	5.0	.6	74/03/07	87/12/21
					K	3	1.000000	.0000000	.0000000	1.0	1.0	76/03/25	84/06/25
					TOT	136	1.783800	.8475500	.9206200	5.0	.6	74/03/07	87/12/21
00322	BOD	10 DAY	MG/L	WATER		1	1.600000			1.6	1.6	78/11/24	78/11/24
00334	BOD	19 DAY	MG/L	WATER		1	287.0000			287.0	287.0	81/03/31	81/03/31
00335	COD	LOWLEVEL	MG/L	WATER		1	44.00000			44.0	44.0	85/01/02	85/01/02
00339	COD MUD	DRY WGT	MG/KG	WATER		12	46550.00	1350E+06	36742.00	135000	7600	75/02/25	86/12/04
00340	COD	HI LEVEL	MG/L	WATER		6	245.5000	36054.00	189.8800	580	100	74/09/19	85/12/16
00400	PH		SU	WATER		164	7.785000	.1904200	.4363800	10.00	5.60	74/05/29	87/12/21
00402	SPECIFIC	CONDUCT	UMHOS/CM	WATER		711	32223.00	1385E+05	11772.00	215000	0	77/04/28	87/12/21
00403	PH	LAB	SU	WATER		141	7.686500	.0974610	.3121900	8.1	5.7	74/03/07	87/12/21
00410	T ALK	CACO3	MG/L	WATER		140	81.94400	314.9800	17.74800	130	40	74/03/07	87/12/21
00480	SALINITY		PPTH	WATER		725	23.43200	42.75800	6.539000	40.0	.5	74/09/19	87/12/21
00530	RESIDUE	TOT NFLT	MG/L	WATER		86	15.35900	183.8400	13.55900	63	2	78/04/24	87/12/21
00557	OIL-GRSE	MUD FRGR	MG/KG	WATER		12	371.6700	175050.0	418.3900	1600.000	60.000	75/02/25	87/12/21
00600	TOTAL N	N	MG/L	WATER		1	4.700000			4.70	4.70	87/09/29	87/09/29
00610	NH3+NH4-	N TOTAL	MG/L	WATER		101	.2613800	.0806390	.2839700	2.000	.050	75/04/08	87/11/24
					K	15	.0440000	.0001542	.0124210	.050	.020	74/11/25	87/12/21
					TOT	116	.2332700	.0755070	.2747900	2.000	.020	74/11/25	87/12/21
00612	UN-IONZD	NH3-N	MG/L	WATER	$	90	.0064413	.0000625	.0079102	.041	.0003	76/03/25	87/12/21
00619	UN-IONZD	NH3-NH3	MG/L	WATER	$	90	.0078320	.0000925	.0096180	.049	.0003	76/03/25	87/12/21
00625	TOT KJEL	N	MG/L	WATER		111	.6979200	.3002700	.5479700	3.400	.100	75/01/27	87/12/21

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S CHAN CHIN HBR AT BELL BUOY 28
45019 SOUTH CAROLINA CHARLESTON
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21SC60WQ 03050202
0000 FEET DEPTH

TYPA/AMBNT/LSTURY/SOLIDS/BIO

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00625	TOT KJEL	N	MG/L	WATER	K	5	.1140000	.0029800	.0545900	.200	.050	74/11/25	85/02/01
00625	TOT KJEL	N	MG/L	WATER	TOT	116	.6727500	.3015000	.5490900	3.400	.050	74/11/25	87/12/21
00626	ORGAN. N	MUD D WT	MG/KG-N	WATER		9	371.8600	185000.0	430.1100	1190.00	4.50	75/02/25	84/01/30
00627	KJELDL	N TOT MU D	MG/KG	WATER		3	732.0000	98812.00	314.3400	1000.000	386.000	86/02/14	87/12/21
00630	NO2&NO3	N-TOTAL	MG/L	WATER		126	.1038900	.0168680	.1298800	1.38	.02	74/03/07	87/12/21
					K	3	.0200000	.0000000	.0000000	.02	.02	76/10/26	85/01/02
					TOT	129	.1019400	.0166340	.1289700	1.38	.02	74/03/07	87/12/21
00660	ORTHOPO4	PO4	MG/L	WATER		11	.1890900	.0044491	.0667020	.33	.12	74/03/07	75/04/08
00665	PHOS-TOT		MG/L P	WATER		90	.0956660	.0027956	.0528730	.360	.030	75/06/05	87/09/29
					K	24	.0595830	.0026390	.0513710	.300	.030	74/11/25	87/12/21
					TOT	114	.0880700	.0029573	.0543810	.360	.030	74/11/25	87/12/21
00668	PHOS MUD	DRY WGT	MG/KG-P	WATER		10	853.2900	213740.0	462.3200	1400.0	3.8	77/02/22	87/12/21
					K	1	2.500000			2.5	2.5	83/01/24	83/01/24
					TOT	11	503.2200	219950.0	468.9900	1400.0	2.6	77/02/22	87/12/21
00680	T ORG C	C	MG/L	WATER		95	4.785000	7.734900	2.781200	16.5	1.5	74/11/25	87/12/21
00900	TOT HARD	CACO3	MG/L	WATER		4	3495.000	418770.0	647.1200	4000	2580	79/01/30	87/05/28
00916	CALCIUM	CA-TOT	MG/L	WATER		2	250.0000	200.0000	14.14200	260.0	240.0	85/02/01	86/05/12
00925	MGNSIUM	MG,DISS	MG/L	WATER		9	373.7800	10626.00	103.0900	506.0	244.0	76/03/12	76/03/25
00927	MGNSIUM	MG,TOT	MG/L	WATER		2	805.0000	50.00000	7.071100	810.0	800.0	85/02/01	86/05/12
01000	ARSENIC	AS,DISS	UG/L	WATER	K	3	45.00000	2425.000	49.24400	100	5	74/03/07	74/11/25
01025	CADMIUM	CD,DISS	UG/L	WATER		1	40.00000			40	40	77/08/25	77/08/25
					K	16	23.75000	985.0000	31.38500	100	10	74/03/07	77/04/25
					TOT	17	24.70600	938.9700	30.64300	100	10	74/03/07	77/08/25
01027	CADMIUM	CD,TOT	UG/L	WATER		2	38.50000	4.500000	2.121300	40	37	78/04/24	78/07/13
					K	31	10.00000	.0000000	.0000000	10	10	78/10/26	87/10/26
					TOT	33	11.72700	47.83000	6.915900	40	10	78/04/24	87/10/26
01028	CD MUD	DRY WGT	MG/KG-CD	WATER		1	1.000000			1.00	1.00	78/05/03	78/05/03
					K	12	.9541700	.0205910	.1434900	1.00	.50	75/02/25	87/12/21
					TOT	13	.9576900	.0190360	.1379700	1.00	.50	75/02/25	87/12/21
01029	CHROMIUM	SEDMG/KG	DRY WGT	WATER		13	15.49200	104.9200	10.24300	34.00	4.80	75/02/25	87/12/21
01030	CHROMIUM	CR,DISS	UG/L	WATER		2	133.5000	13945.00	118.0900	217	50	74/03/07	76/03/25
					K	15	56.66700	309.5300	17.59300	100	50	74/04/23	77/08/25
					TOT	17	65.70600	1793.500	42.35000	217	50	74/03/07	77/08/25
01034	CHROMIUM	CR,TOT	UG/L	WATER		1	50.00000			50	50	78/04/24	78/04/24
					K	32	50.00000	.0000000	.0000000	50	50	78/07/13	87/10/26
					TOT	33	50.00000	.0000000	.0000000	50	50	78/04/24	87/10/26
01040	COPPER	CU,DISS	UG/L	WATER		4	480.2500	209420.0	457.6300	1111	100	74/03/07	77/08/25
					K	17	97.05900	147.0600	12.12700	100	50	74/04/23	77/04/25
					TOT	21	170.0500	55304.00	235.1700	1111	50	74/03/07	77/08/25

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S CHAN CHTN HBR AT BELL BUOY 28
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030802
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21SC60WQ 03050202
0000 FEET DEPTH

'TYPA/AMBNT/ESTUARY/SOLIDS/BIO

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01042	COPPER	CU,TOT	UG/L	WATER		6	66.66700	666.6700	25.82000	100	50	78/07/13	86/06/12
					K	33	63.63600	511.3700	22.61400	100	50	78/04/24	87/10/26
					TOT	39	64.10300	519.5700	22.79400	100	50	78/04/24	87/10/26
01043	COPPER	SEDMG/KG	DRY WGT	WATER		8	10.89400	20.09800	4.483000	17.00	5.00	75/02/25	87/12/21
					K	5	7.920000	7.132000	2.670600	10.00	5.00	77/02/22	86/02/14
					TOT	13	9.750000	16.36800	4.045800	17.00	5.00	75/02/25	87/12/21
01045	IRON	FE,TOT	UG/L	WATER		39	417.4400	49409.00	222.2800	1100	160	78/04/24	87/10/26
01046	IRON	FE,DISS	UG/L	WATER		20	366.9500	61970.00	248.9400	1000	59	74/04/23	77/08/25
					K	2	150.0000	5000.000	70.71100	200	100	74/03/07	75/06/05
					TOT	22	347.2300	60382.00	245.7300	1000	59	74/03/07	77/08/25
01049	LEAD	PB,DISS	UG/L	WATER		17	160.2400	8968.900	94.70400	320	2	74/03/07	77/08/25
					K	5	80.00000	4500.000	67.08200	200	50	74/04/23	75/06/05
					TOT	22	142.0000	8875.200	94.20800	320	2	74/03/07	77/08/25
01051	LEAD	PB,TOT	UG/L	WATER		25	296.0000	10000.00	100.0000	510	120	78/04/24	84/04/16
					K	8	50.00000	.0000000	.0000000	50	50	86/02/14	87/10/26
					TOT	33	236.3600	18962.00	137.7000	510	50	78/04/24	87/10/26
01052	LEAD	SEDMG/KG	DRY WGT	WATER		12	20.25800	213.2900	14.60400	50.00	6.00	75/02/25	86/12/04
					K	1	5.000000			5.00	5.00	87/12/21	87/12/21
					TOT	13	19.08500	213.4200	14.60900	50.00	5.00	75/02/25	87/12/21
01053	MN MUD	DRY WGT	MG/KG-MN	WATER		2	118.0000	2738.000	52.32600	155.00	81.00	75/02/25	86/02/14
01055	MANGNESE	MN	UG/L	WATER		10	68.00000	1595.600	39.94400	180.0	50.0	78/07/13	84/04/16
					K	29	50.00000	.0000000	.0000000	50.0	50.0	78/04/24	87/10/26
					TOT	39	54.61500	441.3000	21.00700	180.0	50.0	78/04/24	87/10/26
01056	MANGNESE	MN,DISS	UG/L	WATER		3	76.66700	33.33600	5.773700	80.0	70.0	75/04/08	77/04/25
					K	10	50.00000	.0000000	.0000000	50.0	50.0	75/03/12	77/08/25
					TOT	13	56.15400	142.3100	11.92900	80.0	50.0	75/03/12	77/08/25
01065	NICKEL	NI,DISS	UG/L	WATER		10	126.0000	626.6700	25.03300	170	100	75/03/12	77/08/25
					K	3	100.0000	.0000000	.0000000	100	100	75/10/20	76/03/25
					TOT	13	120.0000	600.0000	24.49500	170	100	75/03/12	77/08/25
010 7	NICKEL	NI,TOTAL	UG/L	WATER		28	146.4300	3660.900	60.50500	280	50	78/04/24	85/10/21
					K	11	50.00000	.0000000	.0000000	50	50	84/08/06	87/10/26
					TOT	39	119.2300	4533.600	67.33200	280	50	78/04/24	87/10/26
010 8	NICKEL	SEDMG/KG	DRY WGT	WATER		8	10.56300	14.26300	3.776600	16.00	5.60	75/02/25	87/12/21
					K	5	7.920000	7.132000	2.670600	10.00	5.00	77/02/22	86/02/14
					TOT	13	9.546200	12.48800	3.533800	16.00	5.00	75/02/25	87/12/21
01090	ZINC	ZN,DISS	UG/L	WATER		1	280.0000			280	280	75/04/08	75/04/08
					K	13	100.0000	.0000000	.0000000	100	100	74/11/25	77/08/25
					TOT	14	112.8600	2314.300	48.10700	280	100	74/11/25	77/08/25
01092	ZINC	ZN,TOT	UG/L	WATER		20	139.0000	9809.500	99.04300	410	60	78/04/24	87/07/06

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32 45 50.0 079 53 10.0 3
5 CHAN CHIN HBR AT BELL BUOY 28
46019 SOUTH CAROLINA CHARLESTON
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21SC60WQ 03050202
0000 FEET DEPTH

IYPE/AMBNT/LSTORY/SOLIDS/BIO

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01092	ZINC	ZN.TOT	UG/L	WATER	K	19	65.79000	570.1800	23.87900	100	50	78/10/26	87/10/26
01092	ZINC	ZN.TOT	UG/L	WATER	TOT	39	103.3300	6549.100	80.92700	410	50	78/04/24	87/10/26
01093	ZINC	SEDMG/KG	DRY WGT	WATER		13	34.46900	373.8500	19.33500	70.00	9.10	75/02/25	87/12/21
31616	FEC COL1	MFM-FCBR	/100ML	WATER		98	442.1800	10074000	3173.900	31500	1	74/03/07	87/12/21
					J	34	117.3000	36168.00	190.1800	830	2	77/02/22	87/10/26
					K	5	2.000000	1.500000	1.224800	4	1	81/01/26	87/06/29
					L	4	450.0000	90000.00	300.0000	800	200	74/08/21	79/07/27
					TOT	141	348.4500	7013600	2648.300	31500	1	74/03/07	87/12/21
34257	BETA BHC	SEDUG/KG	DRY WGT	WATER	K	3	2.000000	.0000000	.0000000	2.000	2.000	86/02/14	87/12/21
34354	ENDSULSF	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34359	BENDOSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34364	AENDOSUL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
34369	ENDRINAL	SEDUG/KG	DRY WGT	WATER	K	1	2.000000			2.000	2.000	87/12/21	87/12/21
39076	ALPHABHC	SEDUG/KG	DRY WGT	WATER	K	3	2.000000	.0000000	.0000000	2.000	2.000	86/02/14	87/12/21
39300	P,P'LDT		TOT UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39301	P,P'LDT	SEDUG/KG	DRY WGT	WATER		1	.5100000			.51	.51	75/02/25	75/02/25
					K	11	1.650000	.6065100	.7787900	2.00	.05	77/02/22	87/12/21
					TOT	12	1.565000	.6596700	.8122000	2.00	.05	75/02/25	87/12/21
39305	O,P' DDT	WHL SMPL	UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39306	O,P' DDT	MUD DRY	UG/KG	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39310	P,P'DDD		TOT UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39311	P,P'DDD	SEDUG/KG	DRY WGT	WATER		1	3.850000			3.85	3.85	75/02/25	75/02/25
					K	11	1.650000	.6065100	.7787900	2.00	.05	77/02/22	87/12/21
					TOT	12	1.833300	.9547000	.9770900	3.85	.05	75/02/25	87/12/21
39315	O,P' DDD	WHL SMPL	UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39316	O,P' DDD	MUD DRY	UG/KG	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39320	P,P'DDE		TOT UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39321	P,P'DDE	SEDUG/KG	DRY WGT	WATER		1	.4500000			.45	.45	75/02/25	75/02/25
					K	11	1.650000	.6065100	.7787900	2.00	.05	77/02/22	87/12/21
					TOT	12	1.550000	.6713700	.8193700	2.00	.05	75/02/25	87/12/21
39327	O P DDE	WHL SMP	L UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39328	O,P'DDE	MUD	UG/KG	WATER	K	3	2.000000	.0000000	.0000000	2.00	2.00	86/02/14	87/12/21
39330	ALDRIN		TOT UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39333	ALDRIN	SEDUG/KG	DRY WGT	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39337	ALPHABHC		TOTUG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/ 5/28
39338	BETA BHC		TOTUG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39343	GEHC-MUD	LINDANE	DRYUG/KG	WATER	K	1	.1000000			.10	.10	75/02/25	75/02/25
39350	CHLRDANE	TECH&MET	TOT UG/L	WATER	K	1	.0500000			.050	.050	87/05/28	87/05/28
39351	CDANEDRY	TECH&MET	MUDUG/KG	WATER	K	3	2.000000	.0000000	.0000000	2.00	2.00	84/01/30	87/12/21

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32 45 50.0 079 53 10.0 3
S CHAN CHTN HBR AT BELL BUOY 28
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030802
SANTEE-COOPER RIVER BASIN
21SC60WQ 03050202
0000 FEET DEPTH

'TYPA/AMBNT/ESTORY/SOLIDS/BIO

	PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39357	RONNEL	WHL SAMP	UG/L	WATER	K	1	.1000000			.100	.100	87/05/28	87/05/28
39380	DIELDRIN		TOTUG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39383	DIELDRIN	SEDUG/KG	DRY WGT	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39390	ENDRIN		TOT UG/L	WATER	K	7	.0500000	.0000000	.0000000	.050	.050	79/02/12	86/05/12
39393	ENDRIN	SEDUG/KG	DRY WGT	WATER	K	11	1.477300	.8016900	.8953700	2.00	.05	75/02/25	87/12/21
39398	ETHION	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	79/02/12	87/05/28
39399	ETHION	MUD	UG/KG	WATER	K	9	2.900000	2.790000	1.670300	4.00	.10	75/02/25	87/12/21
39400	TOXAPHEN		TOTUG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39403	TOXAPHEN	SEDUG/KG	DRY WGT	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39410	HEPTCHLR		TOTUG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39413	HEPTCHLR	SEDUG/KG	DRY WGT	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39420	HPCHLREP		TOTUG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39423	HPCHLREP	SEDUG/KG	DRY WGT	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21
39480	METHXYCLR	WHL SMPL	UG/L	WATER	K	3	.0500000	.0000000	.0000000	.050	.050	85/01/02	87/05/28
39481	METHXYCLR	MUD DRY	UG/KG	WATER	K	3	2.000000	.0000000	.0000000	2.00	2.00	86/02/14	87/12/21
39491	PCB-1221	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39495	PCB-1232	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39499	PCB-1242	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39503	PCB-1248	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39507	PCB-1254	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39511	PCB-1260	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
39514	PCB-1016	SEDUG/KG	DRY WGT	WATER	K	1	10.00000			10.00	10.00	87/12/21	87/12/21
3951	PCES	WHL SMPL	UG/L	WATER	K	8	.5000000	.0000000	.0000000	.500	.500	79/02/12	87/05/28
39519	PCES	MUD	UG/KG	WATER	K	10	8.550000	10.47000	3.235700	10.00	.50	77/02/22	86/12/04
39530	MALATHN	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	79/02/12	87/05/28
39531	MALATHN	MUD	UG/KG	WATER	K	9	2.900000	2.790000	1.670300	4.00	.10	75/02/25	87/12/21
39540	PARATHN	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	79/02/12	87/05/28
39541	PARATHN	MUD	UG/KG	WATER	K	9	2.900000	2.790000	1.670300	4.00	.10	75/02/25	87/12/21
39570	DIAZINON	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	79/02/12	87/05/28
39571	DIAZINON	MUD	UG/KG	WATER	K	9	2.900000	2.790000	1.670300	4.00	.10	75/02/25	87/12/21
39580	GUTHION	WHL SMPL	UG/L	WATER	K	7	.1000000	.0000000	.0000000	.100	.100	79/02/12	87/05/28
39581	GUTHION	MUD DRY	UG/KG	WATER	K	9	2.900000	2.790000	1.670300	4.00	.10	75/02/25	87/12/21
39600	MPARATHN	WHL SMPL	UG/L	WATER	K	1	.1000000			.100	.100	87/05/28	87/05/28
39610	PHOSDRIN	WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/02/12	86/05/12
39701	PCB	SEDUG/KG	DRY WGT	WATER	K	1	4.000000			4.00	4.00	87/12/21	87/12/21
39755	MIREX	WHL SMPL	UG/L	WATER	K	1	.0500000			.05	.05	87/05/28	87/05/28
39758	MIREX	BOT MAT	UG/KG	WATER	K	2	3.000000	2.000000	1.414200	4.00	2.00	86/12/04	87/12/21
39782	LINDANE	WHL SMPL	UG/L	WATER	K	8	.0500000	.0000000	.0000000	.050	.050	79/02/12	87/05/28
39783	LINDANE	MUD DRY	UG/KG	WATER	K	12	1.520800	.7515800	.8669400	2.00	.05	75/02/25	87/12/21

MD-048
32 45 50.0 079 53 10.0 3
S CHAN CHTN HBR AT BELL BUOY 28
45019 SOUTH CAROLINA CHARLESTON
SOUTHEAST 030802
SANTEE-COOPER RIVER BASIN
!YPA/AMBNT/LSTURY/SOLIDS/BIO 21SC60WQ 03050202
0000 FEET DEPTH

	PARAMETER		MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
39786	TRITHION WHL SMPL	UG/L	WATER	K	6	.1000000	.0000000	.0000000	.100	.100	79/02/12	86/05/12
39787	TRITHION MUD	UG/KG	WATER	K	9	2.900000	2.790000	1.670300	4.00	.10	75/02/25	87/12/21
46582	ACID-EXT ORGANICS	CODE	WATER		1	.0000000			0	0	86/05/12	86/05/12
46583	BASE-NEU EXT ORG	CODE	WATER		1	.0000000			0	0	86/05/12	86/05/12
46670	CAL HARD CA MG	MG/L	WATER	$	2	3939.200	4160.000	64.49800	3985	3894	85/02/01	86/05/12
70310	PH SU	BOT MUD	WATER		6	7.616700	.1776900	.4215300	8.0	6.9	82/02/19	87/12/21
70320	MOISTURE CONTENT	PERCENT	WATER		13	50.25400	361.3700	19.01000	77	23	75/02/25	87/12/21
70322	RESIDUE TOT VOL	PERCENT	WATER		12	7.216700	21.00500	4.583200	15.0	1.0	75/02/25	87/12/21
				K	1	1.000000			1.0	1.0	80/03/25	80/03/25
				TOT	13	6.738500	22.22800	4.714600	15.0	1.0	75/02/25	87/12/21
70507	PHOS-T ORTHO	MG/L P	WATER		7	.0428570	.0004238	.0205870	.070	.020	75/06/05	79/07/27
				K	1	.0200000			.020	.020	75/07/29	75/07/29
				TOT	8	.0400000	.0004285	.0207020	.070	.020	75/06/05	79/07/27
71900	MERCURY HG,TOTAL	UG/L	WATER		36	.9236100	1.186700	1.089300	5.6	.2	74/04/23	85/10/21
				K	19	.2947400	.0305270	.1747200	.8	.2	76/01/23	87/10/26
				TOT	55	.7063600	.8703900	.9329500	5.6	.2	74/04/23	87/10/26
71921	MERCURY SEDMG/KG	DRY WGT	WATER		3	.1500000	.0075000	.0866030	.2	.05	75/02/25	82/02/19
				K	9	.2333300	.0006250	.0250010	.3	.2	77/02/22	87/12/21
				TOT	12	.2125000	.0032387	.0569100	.3	.05	75/02/25	87/12/21
74041	%QF SAMPLE	UPDATED	WATER		214	868090.0	38123000	6174.400	880804	860529	84/08/06	87/12/21
78453	PCB-1262 SED DRY	WT UG/KG	WATER	K	1	10.00000			10.000	10.000	87/12/21	87/12/21
80153	SEDIMENT ORG-C	PERCENT	WATER		1	1.120000			1.12	1.12	75/02/25	75/02/25
82048	BOT DPTH OF SMPL	METERS	WATER		797	3.896600	10.26000	3.203200	15.00	.30	74/05/29	87/12/21
84085	VOLATILE ORGANICS	CODE	WATER	TXT	1	TEXT	TEXT	TEXT	TEXT	TEXT	86/07/31	86/07/31

APPENDIX 3

SUMMARY OF SEDIMENT DATA
POOLED FOR ALL SCDHEC MARINE STATIONS
1974 - 1987

GROSS ANALYSIS

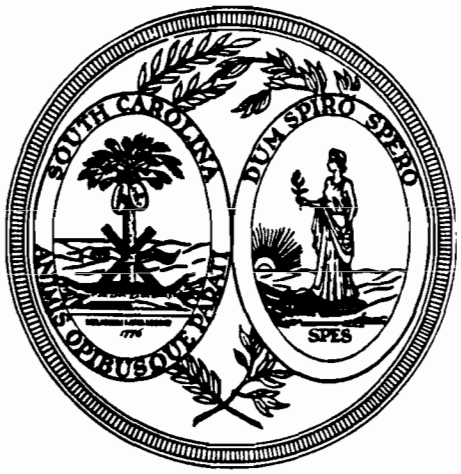
		00339 COD MUD DRY WGT MG/KG	00557 OIL-GRSE MUD FRGR MG/KG	00626 ORGAN. N MUD D WT MG/KG-N	00668 PHOS MUD DRY WGT MG/KG-P	01028 CD MUD DRY WGT MG/KG-CD	01029 CHROMIUM SEDMG/KG DRY WGT	01043 COPPER SEDMG/KG DRY WGT	01052 LEAD SEDMG/KG DRY WGT	01053 MN MUD DRY WGT MG/KG-MN	01068 NICKEL SEDMG/KG DRY WGT
00	PCTL(050.0)	25000.0	220.000	125.000	150.000	1.00000	12.0000	7.40000	17.0000	134.000	9.20000
	PCTL(090.0)	100000	1200.00	2275.00	1650.00	1.00000	32.0000	15.0000	42.0000	483.000	16.0000
	NUMBER	295	313	287	336	551	558	558	559	120	512
	MAXIMUM	431600	24000.0	16000.0	130000	22.2000	86.0000	3000.00	1300.00	1735.00	300.000
	MINIMUM	490.000	.0000000	2.50000	2.50000	.0500000	2.50000	1.00000	.900000	1.80000	4.86000
	MEAN	42140.2	623.558	723.124	1132.13	1.13707	15.8115	15.7682	26.7127	227.212	10.2171
99											

		01093 ZINC SEDMG/KG DRY WGT	39301 P,P'DDT SEDUG/KG DRY WGT	39306 O,P' DDT MUD DRY . UG/KG	39311 P,P'DDD SEDUG/KG DRY WGT	39321 P,P'DDE SEDUG/KG DRY WGT	39333 ALDRIN SEDUG/KG DRY WGT	39351 CDANEDRY TECHNMET MUDUG/KG	39363 DDD MUD UG/KG	39368 DDE MUD UG/KG	39373 DDT MUD UG/KG
00	PCTL(050.0)	27.0000	2.00000	2.00000	2.00000	2.00000	2.00000	2.00000	3.67000	1.72000	2.00000
	PCTL(090.0)	65.0000	2.40000	2.00000	2.00000	2.77000	2.00000	2.00000			2.00000
	NUMBER	554	425	423	425	425	427	89	1	1	30
	MAXIMUM	1680.00	778.000	207.000	170.000	60.0000	3.00000	7.86000	3.67000	1.72000	2.62000
	MINIMUM	5.00000	.0500000	.0500000	.0500000	.0500000	.0500000	2.00000	3.67000	1.72000	2.00000
	MEAN	41.2427	4.11865	2.46020	3.03731	2.61173	1.77894	2.17022	3.67000	1.72000	2.02067
99											

		39383 DIELDRIN SEDUG/KG DRY WGT	39519 PCBS MUD UG/KG	71921 MERCURY SEDMG/KG DRY WGT
00	PCTL(050.0)	2.00000	10.0000	.250000
	PCTL(090.0)	2.00000	67.9000	.300000
	NUMBER	429	347	549
	MAXIMUM	10.0000	1100.00	29.0000
	MINIMUM	.0500000	.500000	.0300000
	MEAN	2.25602	23.5083	.328675
99				

Special Organic Chemical Sampling of Charleston Harbor Sediment and Tissue

Charleston County, South Carolina
1987 through 1989



Technical Report No. 003-89

South Carolina Department of Health and Environmental Control
Office of Environmental Quality Control
2600 Bull Street
Columbia, South Carolina 29201

SPECIAL ORGANIC CHEMICAL SAMPLING

OF

CHARLESTON HARBOR

SEDIMENT AND TISSUE

Prepared by

Douglas P. Darr
Water Quality Monitoring Section

December 1989

Technical Report No: 003-89

Division of Water Quality Assessment and Enforcement
Bureau of Water Pollution Control
Office of Environmental Quality Control
South Carolina Departmental of Health and Environmental Control
Columbia, South Carolina 29201-1797

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SUMMARY

Sediment and/or aquatic animal tissues were collected from thirteen locations in Charleston Harbor and its tributaries by the South Carolina Wildlife and Marine Resources Department (SCWMRD). Collections were made during the first sampling period in 1987 and 1988 and the second sampling period during 1988 and 1989. The South Carolina Department of Health and Environmental Control (SCDHEC) analyzed those samples for pesticides, polychlorinated biphenyls (PCBs), acid and base-neutral extractable organic compounds, and volatile organic compounds.

Organic analyses were conducted for the first time from Charleston Harbor for many of the sample areas, species and chemicals. Therefore, instead of a final investigation, this study should be considered a base upon which an indication of present conditions can be derived and the need for further study can be determined and referenced. Although advances in technology allow for more chemicals to be evaluated when samples can be analyzed, available resources for tissue collections and analyses are limited.

Sixteen different organic compounds were detected in one or more of the sediment and/or tissue samples. No sample exceeded the few criteria for comparison. There are no criteria for sediment (USEPA 1986), while available tissue criteria are based on edible portions of fish and shellfish (USFDA 1982, USFDA 1984). None of the analyses of the whole fish or edible portions of fish collected and analyzed for this study exceeded available criteria even though whole fish generally have higher levels of organic chemicals than do edible portions (Murty 1986).

In sediment, no organic chemicals were detected except at station ARO1, the Ashley River near US Highway 17. At this location, six polynuclear aromatic hydrocarbons (PAHs) were measured at levels which appeared elevated relative to other marine sediment monitoring by SCDHEC. Several PAHs were an order of magnitude above any other SCDHEC marine sediment samples.

Tissue samples included the soft tissues of oysters, somatic muscle of crab, whole shrimp, whole spot, and whole flounder. Organic chemicals were detected in 21 of 32 tissue samples collected the first year and 25 of 30 tissue samples collected the second year. Twelve organic chemicals were detected in one or more tissue samples: chloroform, hexachlorobutadiene, isphorone, chlordane, DDE, DDT, benzoic acid, toluene, 1,2,4-trichlorobenzene, PCBs, and the PAHs fluoranthene and pyrene.

Besides polynuclear aromatic hydrocarbons (PAHs) which were found in the tissues from AR01 as well as the sediment, other organics detected exhibited no spatial pattern. Only two chemicals were found in more than twenty percent of the tissue samples: PCBs and chloroform. PCBs were found in shrimp, spot and flounder composites. The tissue sample with the highest PCB level was a composite of five (5) whole spot containing 538 ug/kg (micrograms per kilogram or parts per billion) of PCBs. The PCB levels observed in this study were similar to other marine samples from South Carolina (Duke et al. 1970, SCDHEC 1989) and are one or two orders of magnitude below USFDA (1984) standards. Chloroform was only detected during the second year of the study, but it was found in eighteen (18) of the thirty (30) samples that year. Chloroform was detected in all species except oysters in levels ranging from 20.0 ug/kg to 518 ug/kg.

Other compounds were only found in a few samples. The chlorinated pesticides chlordane, DDE and DDT were found in oyster and/or spot composites in very low levels (6.0 ug/kg to 9.0 ug/kg). Hexachlorobutadiene (HCBD) was measured in three crab composites during the first year at levels ranging from 293 ug/kg to 518 ug/kg. Isophorone was found in only one shrimp composite at 238 ug/kg which is well below the USEPA (1980g) Acceptable Daily Intake. Toluene was detected the second year in seven (7) shrimp or spot composites; toluene levels ranged from 20.0 ug/kg to 268 ug/kg. Benzoic acid and 1,2,4-trichlorobenzene are easily metabolized chemicals which were only found

in oyster composites. Benzoic acid was found in levels from 382 ug/kg to 1430 ug/kg, and 1,2,4-trichlorobenzene was found once at 344 ug/kg. None of these levels were thought to be of concern.

INTRODUCTION

Charleston Harbor is formed by the confluence of the Cooper, Ashley and Wando Rivers with the Atlantic Ocean in the approximate middle of the South Carolina coastline (Figure 1). The estuary contains nearly 200,000 acres of shellfish growing waters (SCDHEC 1988a), and receives an average of 1,627 m^3/s of freshwater input (Davis and Van Dolah In press) from these three rivers.

Charleston Harbor is a complex system of hydraulics which is controlled by many factors. The hydraulics of the system affects water quality by controlling flushing, mixing and re-aeration. The factors affecting the hydraulics and water quality of Charleston Harbor include tidal currents, wind driven currents, tributary inflows, nonpoint source runoff, and point source discharges. In addition, the hydrologic characteristics of Charleston Harbor have been significantly altered by man.

Besides urban, residential, and industrial development, two significant hydraulic alterations have occurred which affect water quality conditions in the Harbor: (1) the construction of Elliott's Cut which linked the Ashley River with the Stono River/Wadmalaw Sound system; and (2) the diversion of flow from Lakes Marion and Moultrie away from the Santee River basin to the Cooper River basin via the Lake Marion tailrace canal and its subsequent rediversion back to the Santee River basin via the Rediversion Canal. This has resulted in reduced freshwater input relative to before rediversion.

Ten to fifteen percent of the total South Carolina commercial seafood harvest is dependant upon the Charleston Harbor estuary (SCDHEC 1988a). SCWMRD Fisheries Statistics Section reports that Charleston County commercial fisheries harvest during 1988 was worth over four million dollars for shrimp, almost one and a half million dollars for blue crabs and stone crabs, four thousand dollars for spot and sixteen thousand dollars for flounder (Jennings 1989), although not all these were collected from Charleston Harbor itself. Including the processing of seafood, "the total commercial fishery operation

in Charleston Harbor is estimated to be worth from $4.0 to $12.3 million annually to the local economy" (SCDHEC 1988a). With the significance of this fishery and the extensive development adjacent to the Harbor, concerns about chemical contamination of the Harbor and of the Harbor's fish and shellfish need to be addressed.

SCDHEC has a relatively large number of water quality monitoring stations in Charleston Harbor (SCDHEC 1988b). A report has recently been prepared by SCDHEC (Chestnut 1989) which assesses water quality trends in Charleston Harbor from 1974-1987. The report contains information on Charleston Harbor water and sediment quality compared to other South Carolina coastal waters, the trends in water quality observed at these Harbor stations, and comparisons of the quality of water in Charleston Harbor to State and Federal standards.

SCDHEC as well as other organizations have analyzed some fish and shellfish samples from Charleston Harbor for analysis of synthetic organic compounds. Most of this work (SCDHEC 1989, Darr In prep., Duke et al. 1970, Marcus In prep., Marcus and Mathews 1987, NOAA 1988a, NOAA 1988b) has concentrated on chlorinated pesticides and PCBs. Some Charleston Harbor tissue and sediment samples have been analyzed for additional synthetic organic chemicals (SCDHEC 1989, Marcus In prep., Marcus and Renfrow In prep., NOAA 1988a, NOAA 1988b). However, because little work has been done on acid and base-neutral extractable organic compounds and volatile organic compounds in sediment and in tissue from Charleston Harbor, the data presented in this report will establish a baseline for this estuary and be used to determine the most effective sampling program for continued monitoring.

In February of 1987, an agreement was reached between the South Carolina Wildlife and Marine Resources Department (SCWMRD) and the South Carolina Department of Health and Environmental Control (SCDHEC) to sample and analyze sediment, soft portions of oysters, blue crab somatic muscle, whole shrimp, whole spot, and whole flounder from Charleston Harbor. SCWMRD was to

collect the samples, and SCDHEC was to analyze them for chlorinated and organophosphate pesticides, PCBs, acid and base-neutral extractable organic compounds, and volatile organic compounds.

Thirteen stations (Figure 1 and Table 1) were established both within Charleston Harbor and in tidally-influenced areas of the Ashley, Cooper and Wando Rivers for sediment and/or aquatic animal tissue sample collection. At nine stations, both sediment and tissues were collected. At three stations, only sediment was collected, and one station had only a tissue sample collected.

MATERIALS AND METHODS

The Marine Resources Division of the South Carolina Wildlife and Marine Resources Department (SCWMRD) collected all the samples for this study. Sediment was collected using a stainless steel dredge washed with a special high purity isopropanol. Collected sediment was transferred to specially prepared glass bottles and stored on wet ice until they could be frozen in the laboratory. Oysters were collected by hand from oyster reefs or by using oyster tongs for subtidal oysters. The soft tissues of the oysters were extracted in the laboratory and frozen in specially prepared glass bottles. Crabs were collected using baited crab pots or by trawling. Shrimp, spot and flounder were collected by trawl. All samples were placed on ice upon collection and frozen when returned to the laboratory.

The South Carolina Department of Health and Environmental Control (SCDHEC) weighed and measured the crab, flounder and most spot and shrimp. Some spot and shrimp had to be processed by SCWMRD, ground and split with SCDHEC because of the limited numbers collected. Crabs were processed by extracting somatic muscle connected to the crabs' legs and washing with distilled water. This somatic muscle was then frozen in the same type glass bottles that were used for oyster soft tissues.

In order to obtain enough sample and in order to reduce the high variability of organic compounds found in individual fish (Gaymon 1988, Keith 1988), composites were used for analysis. An attempt was made to use similar sized animals both within a sample and between samples.

For the isolation of base-neutral and acid extractable organic compounds (BNA), organophosphorus and organochlorine pesticides, and PCBs, a modified USEPA (1983) method was used for sediment samples, and a modified USFDA/USEPA (USEPA 1974) method was used for fish and shellfish tissue samples. For sediment, 30.0 grams of sub-sample was mixed with anhydrous sodium sulfate and extracted in 1+1 acetone/hexane using an ultrasonic probe. The extract was

filtered, dried, concentrated and cleaned up by florisil or gel permeation chromatography. The purified BNA extracts were restored to 1.0 mL. For each tissue sample, 20.0 grams of homogenized tissue was extracted with 190 mL of ten percent ethyl ether/ninety petroleum ether in a chromatographic column and concentrated by a water bath. The extract volume was restored to 5.0 mL with the appropriate solvent (methylene chloride for BNA or fifty percent methylene chloride/fifty percent n-hexane for pesticides and PCBs) and loaded into the sample loop of the gel permeation chromatograph (GPC) for cleanup. The purified extracts were concentrated to a volume of less than 0.5 mL and then restored to 1.0 mL. For both sediment and tissue samples, BNAs were analyzed on the gas chromatograph/mass spectrometer. Prior to analysis of sediment and tissue samples for organophosphorus and organochlorine pesticides and PCBs, volumes were brought up to a final volume of 10 mL. These extracts were analyzed by gas chromatograph/electron capture detection.

For the analysis of volatile organics, a modified USEPA (1983) method was used for sediment samples, and a modified USEPA (1981) method was used for fish and shellfish tissue. For sediment and tissue samples, a Tekmar Model 4000/42000 (Dynamic Headspace Concentrator/Automatic Heated Sample Module) and a gas chromatograph/mass spectrometer were used for the extraction and analysis of volatiles. To 5.0 grams of sediment or 1.0 gram of tissue, 5.0 mL of deionized water was added. The mixture was spiked with internal standards and surrogate spiking solutions. The sample was then heated to 40°C and purged with helium gas for 5.0 minutes (sediment) or 12.0 minutes (tissue) at a rate of 40 mL/min. After purging was complete, the sample was desorbed from the Tekmar's trap onto the temperature programmed GC for 5.0 minutes. Volatile organic compounds were detected by the mass spectrometer and concentration levels were determined by its data system.

RESULTS AND DISCUSSION

Sediment, oysters, crabs, shrimp, spot and/or flounder were collected from thirteen locations (stations) in Charleston Harbor (Figure 1 and Table 1). Information relative to the collection of these samples, i.e. dates, sizes, and tissues, are presented in Tables 3 through 7. These samples were analyzed for various PCBs (polychlorinated biphenyls), pesticides, acid and base-neutral extractable organic compounds and volatile organic compounds. The lists of specific compounds which were evaluated by techniques used by South Carolina Department of Health and Environmental Control (SCDHEC's) Analytical Services Division are presented in Table 2 for both sediment and tissue. Detection limits for these compounds are also presented in Table 2. Because many of the chemicals evaluated were not detected in any of the samples, only chemicals which were detected are presented below.

Table 8 lists the organic chemicals detected in sediment and tissue during the first year (1987-1988) of sampling. During 1987-1988, organics were detected in one of twelve sediment samples and in 21 of 32 tissue samples. Eight organic chemicals were detected at nine stations: hexachlorobutadiene, isophorone, chlordane, DDE, benzoic acid, polychlorinated biphenyls (PCBs), fluoranthene, and pyrene.

Table 9 lists the organic chemicals detected in sediment and tissue during the second year (1988-1989) of sampling. During 1988-1989, organics were detected in sediment from one of twelve stations and in tissue at 25 of 30 samples. Thirteen organic chemicals were detected: chloroform, DDE, DDT, benzoic acid, toluene, 1,2,4-trichlorobenzene, PCBs, anthracene, benzo(a)-anthracene, benzo(a)pyrene, chrysene, fluoranthene, and pyrene. DDE, PCBs, fluoranthene and pyrene were detected during both years.

Of the sixteen different organic chemicals found in this special sampling of Charleston Harbor, the U.S. Food and Drug Administration (USFDA) has established action levels for four. These levels apply to the levels of these

chemicals detected in the edible portion of fish (or shellfish). The tissue results from this study were for the whole organisms except for crab and oyster, where crabs were processed using somatic (body) muscle only and oysters were processed using edible portion (soft tissues). Use of levels for whole fish are more conservative than for edible portion only, since the levels of organic chemicals found in whole organism are usually higher than that found in its edible portion (Murty 1986). There are no available standards for sediment (USEPA 1986).

Ashley River

Station AR01, the Ashley River near of U. S. Highway 17 South, is one of two stations with data for all sample types during both years. Few discernible generalities are evident in the data from this study, but the most obvious generality is that polynuclear aromatic compounds (PAHs) were high at AR01 relative to other stations in the study. The PAHs anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, and pyrene were found at AR01. PAHs are found in coal tar (Sax and Lewis 1987), are formed by heating coal or petroleum to high temperatures (USEPA 1980e), or as a result of incomplete combustion of organic compounds (USEPA 1980i). PAHs are most evident in the sediment data of AR01. No PAHs were found in the sediment of any station except AR01. Two PAHs were detected the first year at AR01, and six were detected the second year.

The levels of PAHs found in AR01 sediment were high, not only with respect to this special study, but also with respect to the 52 samples taken at 18 ambient marine (saltwater-influenced) stations around the State by SCDHEC (1989) including levels associated with marinas (Marcus and Swearingen 1983). Some of the individual PAH levels were an order of magnitude above the previous high levels seen in SCDHEC's marine sediment monitoring data. NOAA (1988a) reported PAHs in the fine-grained sediment of three Charleston Harbor locations. Average NOAA data was less than what was found at AR01.

PAHs were also found at AR01 in crabs the first year (fluoranthene - 130 ug/kg), shrimp the second (fluoranthene - 130 ug/kg and pyrene - 541 ug/kg), and oysters during both years (fluoranthene - 240 ug/kg and 448 ug/kg). PAHs were found in other tissues around the State (SCDHEC 1989) with 16 of 61 tissues containing fluoranthene up to 149 ug/kg and 16 of 61 tissues containing up to 207 ug/kg of pyrene. Although oysters collected by NOAA (1988b) contained PAHs, NOAA oyster tissue is not readily comparable to this study because it is based on a dry weight basis.

The oyster composite collected from AR01 during the second year was the only sample which contained 1,2,4-trichlorobenzene (1,2,4-TCB). This chemical is commercially produced for a variety of purposes, but mostly as a dye carrier in the application of dyes to polyester materials (USEPA 1980b). During routine monitoring by SCDHEC (1989), 26 marine tissue samples did not contain measurable levels of 1,2,4-TCB.

DDE, a metabolite or breakdown product of the chlorinated pesticide DDT (1,1,1-trichloro-2,2-bis-[p-chlorophenyl]ethane) (USEPA 1980d), was found in two tissue samples from AR01. An oyster composite from 1988 contained 8.0 ug/kg of DDE, and a spot composite the second year had 7.0 ug/kg of DDE. The only other station in this study at which DDT or DDT metabolites were detected was WR01 where DDT (9.0 ug/kg) and DDE (6.0 ug/kg) were found in a composite of spot. These levels were low in comparison to the USFDA standard of 5,000 ug/kg (total DDT plus metabolites) and also below the average for tissue collected from saltwater-influenced areas (SCDHEC 1989).

Toluene (methylbenzene) is a benzene derivative where a methyl group is substituted for one hydrogen. Most of the toluene which is produced is converted to benzene, but toluene is also used to produce other chemicals, as a solvent for paints, and as a gasoline additive (USEPA 1980j). At AR01, shrimp collected the second year were found to contain toluene at a level of 31.0 ug/kg. Toluene was only detected during the second sample period in five

of eight shrimp composites and two of five spot composites. Levels ranged from 20.0 to 268 ug/kg. There was no apparent spatial concentration of toluene. Toluene has been found in twenty percent of the other marine tissue samples analyzed by SCDHEC (1989). When detected during SCDHEC's ambient monitoring of tissue, levels of toluene averaged 24.4 ug/kg with the highest level measured being 75.2 ug/kg.

PCBs are any of over two hundred compounds (Chakrabarty 1982) (usually a complex mixture) which have a basic structure of two connected phenyl groups with various numbers of chlorine atoms attached in various places. Although current use of PCBs is very restrictive (Syracuse Research Corporation 1989), their previous widespread use, their chemical stability, and their ability to sorb to sediment and bioaccumulate in the fats of organisms have caused them to become an environmental problem (USEPA 1980h). During this study, PCBs (polychlorinated biphenyls) were found in three of the ten tissue samples from ARO1. The ARO1 tissue samples with PCBs were shrimp composite from the first year (25.2 ug/kg) and spot composites (111 ug/kg and 95.0 ug/kg) from both years. In SCDHEC's ambient monitoring program (SCDHEC 1989), PCBs were detected in less than twelve percent of the marine tissue samples. When detected (with a detection limit of 50 ug/kg), PCBs in these samples averaged 235.9 ug/kg. Relative to these levels, the PCB levels at ARO1 were moderate for both species.

Chloroform (trichloromethane or $CHCl_3$) is widely used as a chemical solvent and as an intermediate in the production of refrigerants, plastics, and pharmaceuticals. Chloroform is ubiquitous in the environment, both due to its volatile release during its use and manufacture and its formation by the chlorination of water and wastewater (USEPA 1980c). Chloroform was only found the second year of the study, but it was detected in every species except oysters. At ARO1, chloroform was detected in crabs (33.0 ug/kg), spot (107 ug/kg) and flounder (62.1 ug/kg). Chloroform has been detected in marine

tissues collected by SCDHEC. In an assessment of Campbell Creek, chloroform was detected in all oyster tissues including the control station (Marcus and Swearingen 1984).

At station AR02, the Ashley River near U.S. Highway 7, sediment, crabs, shrimp and a finfish were collected each year. Only PCBs were detected the first year while chloroform and toluene were measured the second year. Levels of PCBs (shrimp - 15.0 ug/kg and spot - 123 ug/kg) and chloroform (crabs - 30.5 ug/kg and shrimp - 64.0 ug/kg) were moderate relative to other samples collected during the study. Shrimp the second year had the highest toluene levels of the study (268 ug/kg).

Only sediment samples were collected from station AR03, the Ashley River near the Seaboard Coast Line Railroad. Nothing was detected in the sediment taken during either year.

Charleston Harbor

The main body of Charleston Harbor was represented by four stations. Only one sample, a flounder collected during 1987, was collected from station ANCH, Charleston Harbor northwest of Fort Sumter. The only synthetic chemical found in this flounder was PCBs at a concentration of 151 ug/kg. This was the highest flounder level detected in this study, but was low relative to data generated from other SCDHEC monitoring in the State (SCDHEC 1989) and to the USFDA (1984) action level of 2,000 ug/kg for PCBs.

At CH01, Charleston Harbor near Fort Sumter, only sediment was collected. Nothing was detected in the sediment collected during either year.

At station CH02, Charleston Harbor near the South Carolina Marine Resources Division's boatslips, all sample types were collected both years except that spot were not collected during the first year. Isophorone, pyrene, chlordane, hexachlorobutadiene, chloroform and PCBs were detected in these samples.

Isophorone (3,5,5-trimethyl-2-cyclohexene-1-one) is a solvent for a wide

range of organic chemicals particularly anilide and carbamate herbicides. Prepared from acetone, isophorone is a chemical intermediate utilized in the synthesis of several organic compounds including plant growth retardants (USEPA 1980g). Isophorone was only found in the first year's composite of shrimp from CH02 at a level of 238 ug/kg. SCDHEC's (1989) tissue monitoring found no isophorone in 25 marine tissue samples. Isophorone is a chemical for which the USEPA (1980g) has established an acceptable daily intake (ADI) level of 10.5 mg. Relative to the USEPA ADI, the level of isophorone found in CH02 shrimp is very low. An individual would have to consume almost a hundred pounds of shrimp each day over a 70-year lifetime from the only Charleston Harbor sample in which isophorone was found to consume more than the USEPA's acceptable daily intake.

Pyrene is a PAH (polynuclear aromatic hydrocarbon) composed of four benzene rings arranged like a tilted box (Sax and Lewis 1987). It is found in coal tar and fossil fuels and can be formed as a result of incomplete combustion of organic material. At CH02, pyrene was detected at a concentration of 481 ug/kg in the second year's flounder composite. During this study, pyrene was only found in flounder at CH02 and in sediment and shrimp at AR01. In SCDHEC's (1989) marine tissue monitoring, pyrene was found in 16 of 61 samples. The average level when detected was 38.2 ug/kg; the maximum level measured was 207 ug/kg.

Chlordane is a cyclodiene insecticide (a polycyclic chlorinated hydrocarbon compound which includes aldrin, dieldrin, endosulfan, endrin and heptachlor) (USEPA 1980a). Sale and commercial use of chlordane has been banned (USEPA 1988). Chlordane was only detected at CH02 and CH03 in oysters during the first year of the study. At CH02, 6.36 ug/kg were measured. In SCDHEC's (1989) marine tissue monitoring, chlordane was found in 18 of 163 samples. The average level of chlordane when detected was 6.8 ug/kg. In this study, chlordane was found less often than during SCDHEC's other marine tissue

monitoring, and levels were lower than the average levels found during other marine tissue monitoring. The levels found were well below the 300 ug/kg USFDA action level for chlordane in the edible portion of fish (USFDA 1982).

Hexachlorobutadiene (HCBD) is a multi-use, deliberate by-product of the manufacture of short chain chlorinated hydrocarbons. HCBD has four carbon atoms, six chlorine atoms and no hydrogen (USEPA 1980f). At CH02, 518 ug/kg of HCBD was found only in crab tissue and only during the first year. In SCDHEC's (1989) monitoring data of 26 marine tissue samples, no hexachlorobutadiene was measured with a detection limit of 300 ug/kg.

Chloroform was measured in two CH02 samples. Crabs taken during the second year contained a moderate 42.8 ug/kg. The second year spot composite contained 618 ug/kg, the highest level of the study. PCB levels were low at CH02. Only composites of shrimp (27.0 ug/kg) and flounder (23.0 ug/kg) collected during the first year contained PCBs, and the levels measured were actually below the SCDHEC laboratory's routine detection limit for PCBs.

Station CH03 is located near where the USS Yorktown is moored. Five organic chemicals were detected in the tissue samples from CH03: benzoic acid, toluene, chlordane, chloroform and PCBs. Benzoic acid is a white powder (Verschueren 1983) which is used as an antimicrobial agent or food preservative. Its use is restricted to 0.1% in foods. Benzoic acid occurs naturally in benzoin resin (Sax and Lewis 1987) and is manufactured by the air oxidation of toluene (Windholz et al. 1983). Benzoic acid, along with benzaldehyde, is also a major metabolite of toluene (USEPA 1980j). Detected only in oysters at a level of 440 ug/kg, benzoic acid was found in samples taken from CH03 during the first year. In other SCDHEC (1989) monitoring, benzoic acid has not been found in the 26 marine tissue samples analyzed for benzoic acid.

Also at CH03, toluene was found at a level of 20.0 ug/kg in the 1988-1989 shrimp sample. This was the lowest level of the seven samples with toluene. Low levels of chlordane (5.25 ug/kg) were detected in the first year oyster

sample from CH03. Moderate levels of chloroform were found in shrimp (78.9 ug/kg) and spot (57.4 ug/kg) during the second year. PCBs were measured both years at CH03. The first year PCBs were only found in shrimp (37.0 ug/kg). The second year, both shrimp (61.0 ug/kg) and spot (538 ug/kg) had the highest PCB levels for their species collected during this study, and the level found in the composite of whole spot was the highest of the study. However, this level was low relative to the 2,000 ug/kg USFDA action level for PCBs in the edible portion of fish (USFDA 1984).

Cooper River

Station CR01, the Cooper River near the U.S. Navy breakwater, had samples collected both years for all sample types (but the crab sample during 1988 - 1989 was lost due to laboratory instrument failure). Hexachlorobutadiene (crab - 293 ug/kg), benzoic acid (oyster - 382 ug/kg), PCBs (shrimp - 28.0 ug/kg, spot - 129 ug/kg and flounder - 60.0 ug/kg), toluene (shrimp - 22.7 ug/kg and spot - 20.0 ug/kg), and chloroform (spot - 63.9 ug/kg and flounder 28.1 ug/kg) were detected in tissue samples from CR01. All of the levels found were moderate with respect to other stations.

Only PCBs, toluene and chloroform were detected in tissues from station CR02, the Cooper River near Filbin Creek. PCBs were only found in shrimp (27.0 ug/kg) the first year. Moderate levels of toluene (26.0 ug/kg) and chloroform (66.2 ug/kg) were found in shrimp the second year.

At station CR03, the Cooper River near the Amoco dock, only sediment and a 1987-1988 sample of shrimp were analyzed. No synthetic organic compounds were detected in sediment, and only moderate levels of PCBs (16.0 ug/kg) showed up in the shrimp.

Wando River

At station WR01, the Wando River near Molasses Creek, all sample types were collected both years. Benzoic acid, chloroform, toluene, DDE, DDT,

hexachlorobutadiene, fluoranthene, and PCBs were detected. Several samples had high levels, but overall levels were moderate. Second year oysters from WR01 contained the highest level of benzoic acid (1430 ug/kg) of the study. Second year shrimp from WR01 had the second highest level of chloroform (222 ug/kg). The second year spot had the second highest toluene level during the study (56.9 ug/kg).

At station WR02, the Wando River near Foster Creek, only chloroform was detected but in relatively high levels during the second year in both crab (152 ug/kg) and shrimp (276 ug/kg) composites. Only sediment samples were collected from station WR03, the Wando River near front range marker "E". Nothing was detected in the sediment either year.

CONCLUSIONS

This special synthetic organic chemical assessment of Charleston Harbor sediment and tissue was an important baseline study. It revealed no important organic chemical contamination except for elevated levels of polynuclear aromatic hydrocarbons (PAHs) at one location. Relatively high levels of PAHs (anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, and pyrene) were found in the sediment, oyster soft tissue, crab somatic muscle, and/or whole shrimp in the Ashley River near US Highway 17 (AR01). These PAH levels were elevated, not only in comparison to levels found during the study, but to other monitoring conducted in marine areas by SCDHEC (1989). The cause and extent of these levels will have to be determined by additional sampling.

Besides PAHs, the compounds isophorone, chloroform, hexachlorobutadiene, chlordane, DDE, DDT, benzoic acid, toluene, and 1,2,4-trichlorobenzene were all detected in tissues at least once. Polychlorinated biphenyls (PCBs) and chloroform were the most common organic chemicals found in analyzed tissues. Average PCB levels detected during this study were lower than detected levels of PCBs found in SCDHEC's (1989) other marine monitoring activities. Chloroform had also been detected in tissue samples from other marine areas (SCDHEC 1989). Four of the chemicals detected in tissues have U.S. Food and Drug Administration (1982 and 1984) action levels for levels in edible fish (or shellfish) tissue, but none of these action levels were exceeded.

Some compounds seemed to be species specific with no compound found in every species. Oysters were the only species with benzoic acid (3 of 12 samples) and 1,2,4-trichlorobenzene (1 of 12 samples). These compounds were all relatively volatile and may be present in the water which oysters filter for food. Oysters are stationary and may be of importance for use in monitoring programs because of this, however, they may only be useful for monitoring certain chemicals present in the water and not useful for chemicals frequently associated with sediment, such as PCBs and hexachlorobutadiene.

Crabs were the only species which contained hexachlorobutadiene (HCBD). HCBD tends to sorb to sediment, and crabs are closely associated with the sediment. However, detectable levels of HCBD were found in only three of thirteen crab samples and only during the first year with none detected the second year. Crabs also picked up detectable levels of PAHs where sediment levels were high; however, crabs did not pick up detectable levels of PCBs at any station.

Levels of synthetic organic chemicals in shrimp were less variable than in other species. The more widespread contaminants such as PCBs (8 of 9 samples the first year and 1 of 8 samples the second year), toluene (0 of 9 samples the first year and 5 of 8 samples the second year), and chloroform (0 of 9 samples the first year and 5 of 8 samples the second year) were found in moderate levels in shrimp throughout Charleston Harbor. The PAHs fluoranthene and pyrene were found in shrimp from the station with high sediment PAH levels. This information, the fact that shrimp spend their juvenile lives in a relatively small area (Whitaker 1989), and the short life cycle of shrimp indicate that perhaps shrimp would be a good organism for monitoring tissue levels. However, it is suggested that only the edible portion of the shrimp be used in order to better relate measured levels to patterns of human consumption.

The finfish spot and flounder seemed to have had more variable levels of synthetic organic compounds than the invertebrates did. When compared within a station, spot and flounder levels of organic contamination were often highly variable.

Although oysters and shrimp seem to be the best tools to monitor levels of synthetic organic compounds, more comparison is needed both among finfish and between finfish and various invertebrate species to determine the best tools for monitoring levels of synthetic organic chemicals in the environment. The results of this study have established an important data base for use in future evaluations of Charleston Harbor.

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Figure 1.
Locations of Sampling Stations
Special Organic Ch mical Sampling of Charleston Harbor Sediment and Tissue
Charl ston County, S uth Car lina
1987 through 1989

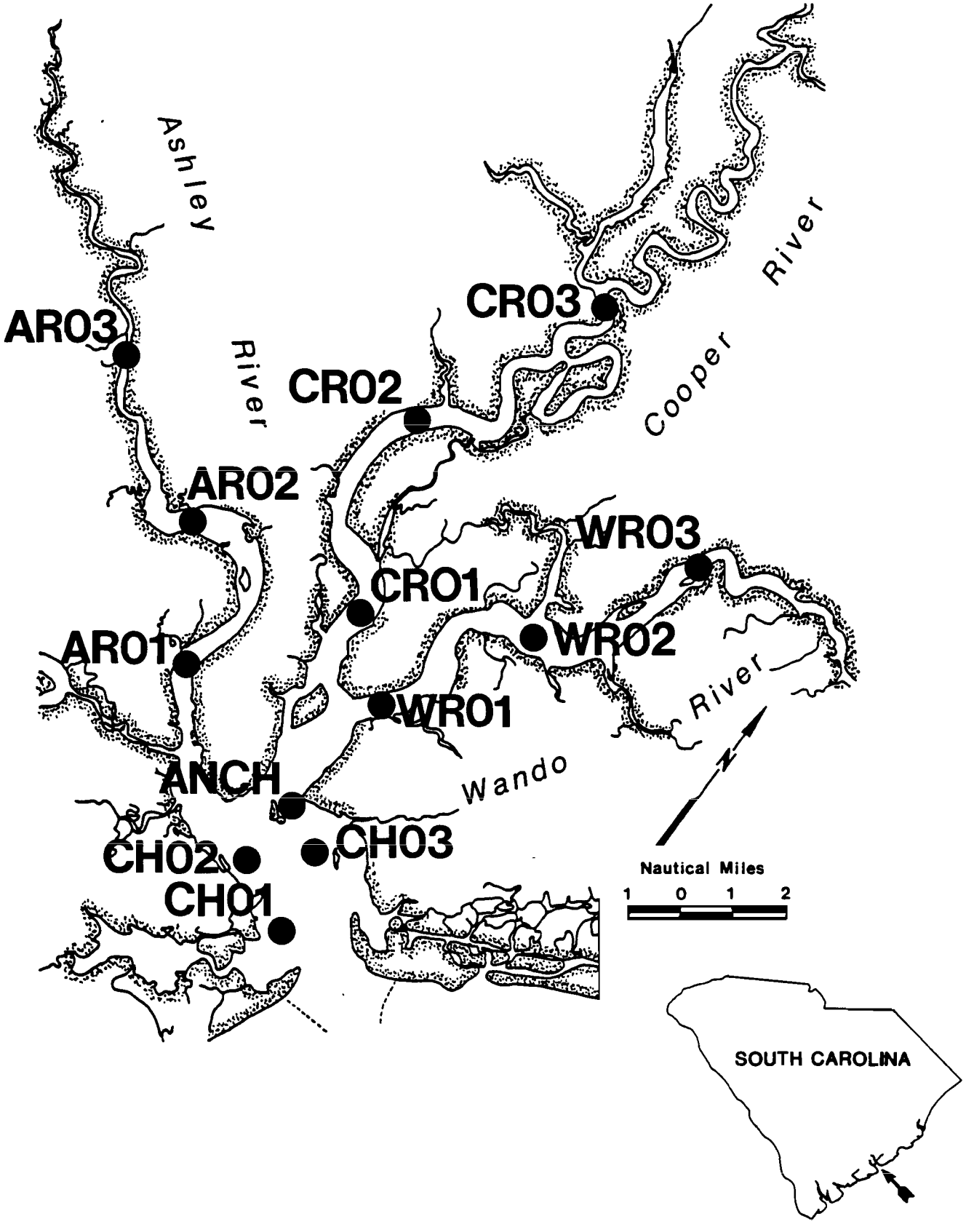

TABLE 1

Station Descriptions

Special Organic Chemical Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Description
ANCH	Charleston Harbor 0.7 nautical mile (1.3 km) from the northeast point of Fort Sumter and 341 degrees from north (midpoint of trawl path) (tissue only). Charleston County.
AR01	Sediment Station: Ashley River 0.48 nautical mile (0.89 km) from where US Highway 17 South crosses the Ashley River Channel at 308 degrees from north.
	Tissue Station: Ashley River Channel 0.28 nautical mile (0.52 km) from where US Highway 17 South crosses the Ashley River Channel at 314 degrees (midpoint of trawl path). Charleston County.
AR02	Sediment Station: Ashley River 0.5 nautical mile (0.9 km) from south base of SC Highway 7 and Ashley River Channel at 256 degrees from the north.
	Tissue Station: Ashley River 0.28 nautical mile (0.52 km) from south base of SC Highway 7 and Ashley River Channel at 248 degrees from north (midpoint of trawl path). Charleston County.
AR03	Ashley River 0.3 nautical mile (0.56 km) from midchannel and Seaboard Coast Line Railroad at 104 degrees from north (sediment only). Charleston County.
CH01	Charleston Harbor 0.1 nautical mile (0.2 km) from northeast point of Fort Sumter at 076 degrees from north (sediment only).
CH02	Sediment Station: Charleston Harbor 0.5 nautical mile (0.9 km) from northeast point of SC Marine Resources Division (SCMRD) boatslips at 282 degrees from north.
	Tissue Station: Charleston Harbor 0.77 nautical mile (1.4 km) from northeast point of SCMRD boatslips at 300 degrees (midpoint of trawl path). Charleston County.
CH03	Sediment Station: Charleston Harbor 0.45 nautical mile (0.83 km) from the northeast corner of the USS Yorktown flight deck at 320 degrees from north.
	Tissue Station: Charleston Harbor 1.5 nautical miles (2.8 km) from the northeast point of Fort Sumter at 332 degrees (midpoint of trawl). Charleston County.

Table 1 (continued)

Station	Description
CR01	Sediment Station: Cooper River 0.23 nautical mile (0.43 km) from US Navy breakwater with green "49" marker at 057 degrees from north. Tissue Station: Cooper River 0.18 nautical mile (0.33 km) from US Navy breakwater with green "49" marker at 041 degrees from north (midpoint of trawl path). Berkeley Co.
CR02	Sediment Station: Cooper River 6.5 nautical miles (12 km) from south point of North Charleston Port Terminal at 044 degrees from north. Tissue Stations: Cooper River 0.2 nautical mile (0.4 km) from northeast confluence of Filbin Creek and Cooper River at 87 degrees (midpoint of trawl path). Charleston-Berkeley County border.
CR03	Sediment Station: Cooper River 0.58 nautical miles (1.1 km) from north tip of Amoco dock near buoy "84" at 313 degrees from north. Tissue Station: Cooper River 0.2 nautical mile (0.4 km) from north tip of Amoco dock near buoy "84" at 312 degrees (midpoint of trawl path). Charleston-Berkeley County Border.
WR01	Sediment Station: Wando River 0.3 nautical mile (o.56 km) from northeast confluence of Molasses Creek and Wando River at 308 degrees from north. Tissue Station: Wando River 0.35 nautical mile (0.65 km) north of the northeast confluence of Molasses Creek and Wando River (midpoint of trawl path). Charleston-Berkeley County border.
WR02	Sediment Station: Wando River 0.4 nautical mile (0.7 km) from northeast confluence of Foster Creek and Wando River at 020 degrees from north. Tissue Station: Wando River 0.5 nautical mile (0.9 km) from northeast confluence of Foster Creek and Wando river at 312 degrees (midpoint of trawl run). Berkeley-Charleston County Border.
WR03	Wando River 0.625 nautical mile (1.16 km) from front range marker "E" at 036 degrees from north (sediment only). Berkeley-Charleston County border.

TABLE 2

Organic Chemicals for Which Sediment and Tissue
Were Analyzed and Their Detection Limits

Special Organic Chemical Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Chemical	Sediment Detection Levels	Tissue Detection Levels	Units
Acenaphthene	300	300	ug/kg
Acenaphthylene	300	300	ug/kg
Anthracene	300	300	ug/kg
Benzo(a)anthracene	300	300	ug/kg
Benzo(b)fluoranthene	300	300	ug/kg
Benzo(k)fluoranthene	300	300	ug/kg
Benzo(a)pyrene	300	300	ug/kg
Benzo(ghi)perylene	300	300	ug/kg
Butylbenzyl phthalate	300	300	ug/kg
Bis(2-chloroethyl)ether	300	300	ug/kg
Bis(2-chloroethoxy)methane	300	300	ug/kg
Bis(2-ethylhexyl)phthalate	300	300	ug/kg
Bis(2-chloroisopropyl)ether	300	300	ug/kg
4-bromophenyl phenyl ether	300	300	ug/kg
2-chloronaphthalene	300	300	ug/kg
4-chlorophenyl phenyl ether	300	300	ug/kg
Chrysene	300	300	ug/kg
Dibenzo(a,h)anthracene	300	300	ug/kg
Di-n-butylphthalate	300	300	ug/kg
1,3-dichlorobenzene	300	300	ug/kg
1,2-dichlorobenzene	300	300	ug/kg
1,4-dichlorobenzene	300	300	ug/kg
3,3'-dichlorobenzidine	300	300	ug/kg
Diethyl phthalate	300	300	ug/kg
Dimethyl phthalate	300	300	ug/kg
2,4-dinitrotoluene	300	300	ug/kg
2,6-dinitrotoluene	300	300	ug/kg
Di-n-octylphthalate	300	300	ug/kg
Fluoranthene	300	300	ug/kg
Fluorene	300	300	ug/kg
Hexachlorobenzene	300	300	ug/kg
Hexachlorobutadiene	300	300	ug/kg
Hexachloroethane	300	300	ug/kg
Indeno(1,2,3-cd)pyrene	300	300	ug/kg
Isophorone	300	300	ug/kg
Naphthalene	300	300	ug/kg
Nitrobenzene	300	300	ug/kg
N-nitrosodi-n-propylamine	300	300	ug/kg
Phenanthrene	300	300	ug/kg
Pyrene	300	300	ug/kg
1,2,4-trichlorobenzene	300	300	ug/kg
4-chloro-3-methyl phenol	300	300	ug/kg

Continued on next page.

Table 2 (continued)

Chemical	Sediment Detection Levels	Tissue Detection Levels	Units
2-chlorophenol	300	300	ug/kg
2,4-dichlorophenol	300	300	ug/kg
2,4-dimethyl phenol	300	300	ug/kg
2,4-dinitrophenol	300	300	ug/kg
2-methyl-4,6-dinitrophenol	300	300	ug/kg
2-nitrophenol	300	300	ug/kg
4-nitrophenol	300	300	ug/kg
Pentachlorophenol	300	300	ug/kg
Phenol	300	300	ug/kg
2,4,6-trichlorophenol	300	300	ug/kg
Benzidine	300	300	ug/kg
Hexachlorocyclopentadiene	300	300	ug/kg
N-nitrosodimethylamine	300	300	ug/kg
N-nitrosodiphenylamine	300	300	ug/kg
Aniline	300	300	ug/kg
Benzyl alcohol	300	300	ug/kg
2-methylphenol	300	300	ug/kg
4-methylphenol	300	300	ug/kg
Benzoic acid	300	300	ug/kg
4-chloroaniline	300	300	ug/kg
2-methyl naphthalene	300	300	ug/kg
2,4,5-trichlorophenol	300	300	ug/kg
2-nitroaniline	300	300	ug/kg
3-nitroaniline	300	300	ug/kg
Dibenzofuran	300	300	ug/kg
4-nitroaniline	300	300	ug/kg
Azobenzene	300	300	ug/kg
A-ßHC	2.0	5.0	ug/kg
ß-ßHC	2.0	5.0	ug/kg
Lindane	2.0	5.0	ug/kg
Heptachlor	2.0	5.0	ug/kg
Heptachlor expoxide	2.0	5.0	ug/kg
Aldrin	2.0	5.0	ug/kg
Dieldrin	2.0	5.0	ug/kg
Endrin	2.0	5.0	ug/kg
Methoxychlor	2.0	5.0	ug/kg
p,p'-DDE	2.0	5.0	ug/kg
p,p'-DDD	2.0	5.0	ug/kg
p,p'-DDT	2.0	5.0	ug/kg
o,p'-DDE	2.0	5.0	ug/kg
o,p'-DDD	2.0	5.0	ug/kg
o,p'-DDT	2.0	5.0	ug/kg
Chlordane	2.0	5.0	ug/kg
Toxaphene	2.0	5.0	ug/kg
Endosulfan I	2.0	5.0	ug/kg
Endosulfan II	2.0	5.0	ug/kg
Endosulfan sulfate	2.0	5.0	ug/kg
Endrin aldehyde	2.0	5.0	ug/kg

Continued on next page.

Table 2 (continued)

Chemical	Sediment Detection Levels	Tissue Detection Levels	Units
PCB 1016	10.0	50.0	ug/kg
PCB 1221	10.0	50.0	ug/kg
PCB 1232	10.0	50.0	ug/kg
PCB 1242	10.0	50.0	ug/kg
PCB 1248	10.0	50.0	ug/kg
PCB 1254	10.0	50.0	ug/kg
PCB 1260	10.0	50.0	ug/kg
PCB 1262	10.0	50.0	ug/kg
Total PCB	10.0	50.0	ug/kg
Ethion	4.0	25.0	ug/kg
Trithion	4.0	25.0	ug/kg
Guthion	4.0	25.0	ug/kg
Malathion	4.0	25.0	ug/kg
Parathion	4.0	25.0	ug/kg
Diazinon	4.0	25.0	ug/kg
Phosdrin	4.0	25.0	ug/kg
Mirex	4.0	25.0	ug/kg
HCB	4.0	25.0	ug/kg
Methyl parathion	---	25.0	ug/kg
Ronnel	---	25.0	ug/kg
Benzene	20.0	20.0	ug/kg
Bromodichloromethane	20.0	20.0	ug/kg
Bromoform	20.0	20.0	ug/kg
Bromomethane	20.0	20.0	ug/kg
Carbon tetrachloride	20.0	20.0	ug/kg
Chlorobenzene	20.0	20.0	ug/kg
Chloroethane	20.0	20.0	ug/kg
2-chloroethylvinyl ether	20.0	20.0	ug/kg
Chloroform	20.0	20.0	ug/kg
Chloromethane	20.0	20.0	ug/kg
Dibromochloromethane	20.0	20.0	ug/kg
1,2-dichlorobenzene	20.0	20.0	ug/kg
1,3-dichlorobenzene	20.0	20.0	ug/kg
1,4-dichlorobenzene	20.0	20.0	ug/kg
1,1-dichloroethane	20.0	20.0	ug/kg
1,2-dichloroethane	20.0	20.0	ug/kg
1,1-dichloroethene	20.0	20.0	ug/kg
Trans-1,2-dichloroethene	20.0	20.0	ug/kg
1,2-dichloropropane	20.0	20.0	ug/kg
Bis-1,3-dichloropropene	20.0	20.0	ug/kg
Trans-1,3-dichloropropene	20.0	20.0	ug/kg
Ethylbenzene	20.0	20.0	ug/kg
Methylene chloride	20.0	20.0	ug/kg
1,1,2,2-tetrachloroethane	20.0	20.0	ug/kg
Tetrachloroethene	20.0	20.0	ug/kg
Toluene	20.0	20.0	ug/kg
1,1,1-trichloroethane	20.0	20.0	ug/kg
1,1,2-trichloroethane	20.0	20.0	ug/kg
Trichloroethene	20.0	20.0	ug/kg
Trichlorofluoromethane	20.0	20.0	ug/kg
Vinyl chloride	20.0	20.0	ug/kg

TABLE 3

Oyster (*Crassostrea virginica*) Collection Data
Special Organic Chemical Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Study Year	Date	Number in Composite	Tissue Type
AR01	1	04/18/88	49	Edible Portion (soft tissue)
AR01	2	02/02/89	30	Edible Portion
CH02	1	04/18/88	55	Edible Portion
CH02	2	02/02/89	30	Edible Portion
CH03	1	04/14/88	39	Edible Portion
CH03	2	02/01/89	30	Edible Portion
CR01	1	04/14/88	40	Edible Portion
CR01	2	02/01/89	30	Edible Portion
WR01	1	04/15/88	45	Edible Portion
WR01	2	02/01/89	30	Edible Portion
WR02	1	04/15/89	35	Edible Portion
WR02	2	02/01/89	30	Edible Portion

TABLE 4

Crab (Callinectes sapidus) Collection Data

Special Organic Chemical Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Study Year	Date	Number in Composite	Tissue Type	Total Length (cm)			Weight (g)		
					Average	Minimum	Maximum	Average	Minimum	Maximum
AR01	1	12/03/87	10	sm*	15.0	13.0	17.5	211	135	280
AR01	2	11/18/88	10	sm	14.8	13.0	16.8	188	160	285
AR02	1	12/02/87	10	sm	14.4	12.7	15.7	181	147	222
AR02	2	11/17/88	10	sm	13.7	12.0	17.2	130	95	200
CH02	1	12/02/87	10	sm	15.7	14.6	17.5	236	159	290
CH02	2	11/05/88	10	sm	15.4	14.1	16.5	158	108	215
CR01	1	12/03/87	10	sm	14.3	11.3	17.6	166	82	252
CR01	2	11/16/88	10	sm	14.6	13.5	16.0	180	119	225
CR02	1	12/02/87	10	sm	14.4	13.2	17.0	140	106	227
CR02	2	11/16/88	10	sm	15.7	12.8	18.0	195	125	285
WR01	1	12/03/87	10	sm	15.8	14.2	17.5	214	158	303
WR01	2	11/02/88	10	sm	15.6	13.5	17.0	195	145	250
WR02	1	11/18/87	10	sm	15.9	14.5	18.0	204	150	298
WR02	2	11/02/88	10	sm	16.0	14.3	17.4	194	154	240

*sm = Somatic Muscle

TAE 5

Shrimp (Penaeus setiferus) Collection Data

Special Organic Chemcial Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Study Year	Date	Number in Composite	Tissue Type	Total Length (cm)			Weight (g)		
					Average	Minimum	Maximum	Average	Minimum	Maximum
AR01	1	11/17/87	30	Whole	10.2	8.0	11.4	11	6	19
AR01	2	11/03/88	30	Whole	13.5	12.8	15.3	21		
AR02	1	11/17/87	29	Whole	7.6	6.5	11.7	8	4	13
AR02	2	11/03/88	30	Whole	11.7	9.0	16.2	12		
CH02	1	11/17/87	30	Whole	10.9	8.8	12.7	14	8	26
CH02	2	11/03/88	30	Whole	15.2	14.2	17.0	28		
CH03	1	11/18/87	30	Whole	12.2	7.7	13.9	22	11	35
CH03	2	11/02/88	30	Whole	14.8	11.0	16.0	27		
CR01	1	11/16/87	30	Whole	11.4	9.8	14.3	17	11	32
CR01	2	11/04/88	30	Whole	14.2	10.0	15.8	24		
CR02	1	11/16/87	30	Whole	10.5	9.2	13.8	13	9	31
CR02	2	11/04/88	30	Whole	12.8	10.7	14.7	16		
CR03	1	11/16/87	30	Whole	9.8	8.8	10.9	9	8	16
WR01	1	11/18/87	30	Whole	11.0	9.4	12.8	14	9	24
WR01	2	11/02/88	30	Whole	12.3	9.5	15.4	14		
WR02	1	11/18/87	30	Whole	8.8	8.0	9.9	7	6	14
WR02	2	11/02/88	29	Whole	10.6	9.5	14.2	9		

TABLE 6

Spot (*Leiostomus xanthurus*) Collection Data

Special Organic Chemcial Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Study Year	Date	Number in Composite	Tissue Type	Total Length (cm)			Weight (g)		
					Average	Minimum	Maximum	Average	Minimum	Maximum
AR01	1	12/17/87	5	Whole	19.8	19.2	20.8	99	85	110
AR01	2	11/15/88	5	Whole	19.5	18.8	20.2	100	90	110
AR02	1	11/17/87	4	Whole	18.8*	18.0*	20.0*	103	90	116
CH02	2	11/05/87	3	Whole	22.3	22.0	22.5	152	150	156
CH03	1	12/17/87	5	Whole	18.6	17.8	20.3	81	70	107
CH03	2	11/02/88	5	Whole	13.2	9.5	18.8	60	15	123
CR01	1	12/17/87	5	Whole	20.7	19.2	21.7	116	88	136
CR01	2	11/04/88	5	Whole	22.3	18.7	25.5	188	100	290
CR02	1	11/16/87	4	Whole	18.0*	17.0*	19.0*	92	74	119
WR01	1	11/24/87	5	Whole	19.7	18.3	21.3	101	87	119
WR01	2	11/15/88	4	Whole	19.0	15.3	23.7	112	50	217

*Fork Length

TABLE 7

Flounder (*Paralichthys lethostigma*) Collection Data

Special Organic Chemcial Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Study Year	Date	Number in Composite	Tissue Type	Total Length (cm)			Weight (g)		
					Average	Minimum	Maximum	Average	Minimum	Maximum
ANCH	1	11/24/87	5	Whole	25.3	21.6	33.1	188	110	399
ARO1	1	11/17/87	4	Whole	26.8	25.3	28.6	194	155	252
ARO1	2	11/15/88	4	Whole	18.9	15.5	21.5	76	40	120
ARO2	2	11/15/88	3	Whole	20.9	20.5	21.2	95	90	104
CHO2	1	11/17/87	5	Whole	23.9	18.7	27.1	161	66	237
CHO2	2	11/03/88	5	Whole	17.6	12.2	20.0	80	50	120
CRO1	1	11/16/87	3	Whole	22.6	20.5	24.4	127	87	165
CRO1	2	10/06/88	4	Whole	25.1	22.0	29.5	167	94	263
WRO1	1	11/18/88	5	Whole	23.4	19.0	25.8	139	73	196
WRO1	2	11/02/88	5	Whole	25.6	24.7	26.7	188	160	200

TABLE 8

1987-1988 Organic Chemicals Found in Sediment
and Tissue Samples from Charleston Harbor

Special Organic Chemical Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Sediment	Oyster	Crabs	Shrimp	Spot	Flounder
ANCH	NSC	NSC	NSC	NSC	NSC	PCBs-151*
ARO1	F'thene-812 Pyrene-586	F'thene-240 DDE-8.0	F'thene-130	PCBs-25.2	PCBs-111	None
ARO2	None	NSC	None	PCBs-15.0	PCBs-123	NSC
ARO3	None	NSC	NSC	NSC	NSC	NSC
CHO1	None	NSC	NSC	NSC	NSC	NSC
CHO2	None	C'dane-6.36	HCBD-518	Isopho'-238 PCBs-27.0	NSC	PCBs-23.0
CHO3	None	Benzoic-440 C'Dane-5.25	NSC	PCBs-37.0	None	NSC
CRO1	None	None	HCBD-293	PCBs-28.0	PCBs-129	None
CRO2	None	NSC	None	PCBs-27.0	None	NSC
CRO3	None	NSC	NSC	PCBs-16.0	NSC	NSC
WRO1	None	None	F'thene-178 HCBD-386	PCBs-34.0	None	PCBs-36.0
WRO2	None	None	None	None	NSC	NSC
WRO3	None	NSC	NSC	NSC	NSC	NSC

NSC = No sample collected
PCBs = Polychlorinated Biphenyls
F'thene = Fluoranthene
None = No organics were detected
C'dane = Chlordane
HCBD = Hexachlorobutadiene
Isopho' = Isophorone
Benzoic = Benzoic Acid

* All values are micrograms per kilogram (ug/kg or parts per billion).
Sediment values are on a dry weight basis.
Tissue values are on a wet weight basis.

TABLE 9

1988-1989 Organic Chemicals Found in Sediment
and Tissue Samples from Charleston Harbor

Special Organic Chemical Sampling of Charleston Harbor
Sediment and Tissue
Charleston County, South Carolina
1987 through 1989

Station	Sediment	Oyster	Crabs	Shrimp	Spot	Flounder
ANCH	NSC	NSC	NSC	NSC	NSC	NSC
AR01	An'cene-823* Bz'cene-1370 Bz'rene-905 Cr'sene-1880 F'thene-4400 Pyrene-4100	F'thene-448 TCB-344	CFM-33.0	F'thene-310 Pyrene-541 Tol-31.0	DDE-7.0 PCBs-95.0 CFM-107	CFM-62.1
AR02	None	NSC	CFM-30.5	CFM-64.0 TOL-268	NSC	CFM-30.1
AR03	None	NSC	NSC	NSC	NSC	NSC
CH01	None	NSC	NSC	NSC	NSC	NSC
CH02	None	None	CFM-42.8	None	CFM-618	Pyrene-481
CH03	None	None	NSC	PCBs-61.0 CFM-78.9 Tol-20.0	PCBs-538 CFM-57.4	NSC
CR01	None	Benzoic-382	LE,IS	Tol-22.7	CFM-63.9 Tol-20.0	PCBs-60.0 CFM-28.1
CR02	None	NSC	None	CFM-66.2 Tol-26.0	NSC	NSC
CR03	None	NSC	NSC	NSC	NSC	NSC
WR01	None	Benzoic-1430	CFM-20.5	CFM-222	DDE-6.0 DDT-9.0 CFM-25.5 Tol-56.9	PCBs-76.0
WR02	None	None	CFM-152	CFM-276	NSC	NSC
WR03	NSC	NSC	NSC	NSC	NSC	NSC

NSC = No sample collected
An'cene = Anthracene
Bz'cene = Benzo(a)anthracene
Bz'rene = Benzo(a)pyrene
Cr'sene = Chrysene
Tol = Toluene
F'thene = Fluoranthene
TCB = 1,2,4-trichlorobenzene
CFM = Chloroform
Benzoic = Benzoic acid
LE,IS = Laboratory error due to instrument failure, insufficient sample to repeat.

* All values are micrograms per kilogram (ug/kg or parts per billion).
Sediment values are on a dry weight basis.
Tissue values are on a wet weight basis.

RESULTS OF BIOASSAY EVALUATION OF CHARLESTON HARBOR SEDIMENTS C1-C13

CONTRACT NO. DACW 60-78-C-0013

APRIL 1979

FINAL REPORT

PREPARED FOR:

Department of the Army
Charleston District, Corps of Engineers

JONES, EDMUNDS & ASSOCIATES, INC.
730 North Waldo Road
Gainesville, Florida 32601

SECTIONS CITED FROM REFERENCE 23

PAGES: 1, 2, 3

DRAFT

RESOURCE CONSERVATION AND RECOVERY ACT FACILITIES IVNESTIGATION WORK PLAN FOR THE INVESTIGATION OF GROUND WATER CONTAMINATION AT THE DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO) "NORTH YARD SITE" CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA

Prepared for:

NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
Charleston, South Carolina

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Tampa, Florida

April 1988

SECTIONS CITED FROM REFERENCE 24

SECTION: 1.3

FIGURE: 2.1-1

Santee Cooper

One Riverwood Drive, P.O. Box 2946101, Moncks Corner, South Carolina 29461-2901 • (803) 761-8000

June 16, 1992

Mr. Chuck Mason
Ensafe
5724 Summer Trees Drive
Memphis, Tennessee 38134

Dear Mr. Mason:

Per your request, I am providing the Letter of Agreement which outlines the current discharge requirements for the Jefferies Hydro Station. Also included is a copy of the relevant sections of the Rediversion Contract and the Corps' proposed changes to the discharge requirements.

If you have any questions, please call.

Sincerely,

Edward E. Easterlin
Group Leader, Financial Planning

EEE:RBD
enclosures

CONTRACT # DACW60-77-C-0005

executed by

THE UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY

and

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

THIS CONTRACT, entered into this 27th day of December, 1976, by and between the UNITED STATES OF AMERICA (hereinafter called the Government) represented by the Contracting Officer executing this contract, and SOUTH CAROLINA PUBLIC SERVICE AUTHORITY (hereinafter called the Authority) a corporate agency of the State of South Carolina;

W I T N E S S E T H: That,

WHEREAS, the Authority has constructed and is now operating an integrated electric power generating, transmission and distribution system in the State of South Carolina, including a large hydroelectric plant using waters of the Santee and Cooper Rivers, known as the Jefferies Hydro Plant (sometimes called Pinopolis Hydro Plant, hereinafter referred to as Jefferies), which was constructed pursuant to and in compliance with a license issued by the Federal Power Commission, and an adjacent fossil-fueled electric generating plant known as the Jefferies Steam Plant; and

WHEREAS, the Government has determined that diversion of waters from the Santee River into the Cooper River, for use through Jefferies, has caused excessive shoaling in Charleston Harbor; and

WHEREAS, the Cooper River Rediversion Project, (hereinafter referred to as the Project), was authorized by the Rivers and Harbors Act of 1968 (P. L. 90-483, 90th Congress, 2d Sess.; 82 Stat. 731; Senate Document 88; hereinafter referred to as P. L. 90-483), to permanently reduce shoaling in Charleston Harbor; and

WHEREAS, it is the intention of the Government to construct the Project, which will include the St. Stephen Hydro Plant (hereinafter referred to as St. Stephen) with three generating units to be installed concurrently, and with exceptions as noted herein, to operate and maintain it until such time as transfer of title to the Authority is made; and

WHEREAS, P. L. 90-483 provides that the Authority shall have first priority to the power made available by the construction and operation of the Project; and

WHEREAS, the Project will divert a large part of the present flow of water at Jefferies, thereby diminishing the energy output of the plant, and its usefulness and value; and

WHEREAS, Jefferies was planned for the addition of one generating unit of 30,600 kw capacity, and substantial costs have been incurred to make such addition possible; and

WHEREAS, the construction and implementation of the Project will restrict Cooper River flows passing the existing Jefferies Steam Plant and thereby may require the construction of a cooling water system; and

WHEREAS, one of the features of the Project will be a hydroelectric generating plant (St. Stephen) of 84,000 kw capacity which will make use of the diverted water, although with lesser energy production than if such water were utilized at Jefferies, and the additional capacity will have potential value as a part of the Authority's power system; and

WHEREAS, in light of the potential impact of the Project on the Authority's system, the parties have carried on discussions which are incorporated in a report on the Project by the Chief of Engineers to the Secretary of Army printed as Senate Document 88, 90th Congress, and referred to under said designation in P. L. 90-483; and

WHEREAS, the parties desire that the Government be compensated for the Project's benefits to the Authority and that the Authority be compensated for the adverse effects of the Project;

Now, THEREFORE, the parties hereto mutually covenant and agree as follows:

SECTION 1. Obligations of the Government. Subject to the availability of funds, the obligations of the Government will include the following:

1.1 Construct authorized improvements substantially in accordance with the provisions of P. L. 90-483, consisting of a rediversion canal, power plant and appurtenant facilities, but subject to such deviations, not adversely affecting the Authority, as may be required by final design. The Government will provide the preliminary design to the

Authority for review and comment and will keep the Authority informed as to the Project status and construction schedule. These construction obligations are described briefly as follows:

a. Construct a rediversion canal to connect Lake Moultrie and the Santee River. A hydro power plant (St. Stephen) will be provided about midway on the rediversion canal to utilize the difference in water elevation between the lake and the Santee River. The power plant will be equipped with three fixed blade, propeller-type turbines with rated output of approximately 39,000 hp at 49 feet of head. The generators will be rated at about 28,000 kw per unit. The plant will be sized to discharge water at the rate of 24,500 cfs at the rated head of 49 feet. An automated fish lift will be provided at the power plant.

b. Provide a 115 kv switchyard at St. Stephen consisting of two line bays, one transfer bay and one transformer bay. Bussing and switching arrangements will be compatible with Authority practice for existing installations.

c. Provide and connect two 115 kv transmission lines from the switchyard to the Authority's Pinopolis-Kingstree transmission line, a distance of approximately 2.5 miles. The two new 115 kv transmission lines will be of wood pole H-frame construction corresponding to present type construction used by the Authority.

d. Relocate highways, railroads, and utilities.

e. Provide a fish barrier, if determined necessary by the Government based on post project studies, on the Santee River immediately

upstream of the Mattassee Lake confluence, to direct the anadromous fish runs of the Santee River into the tailrace canal of St. Stephen.

1.2 Operate and maintain the Project until such time as title is transferred to the Authority, except as provided in paragraphs 2.9, 2.10 and 2.11.

1.3 Transfer title to Project facilities and real estate to the Authority at the end of a 50-year term commencing on the date of commercial operation specified in paragraph 3.2. At anytime during the period of this contract, the parties may agree to advance the transfer of title upon a lump sum settlement. Such settlement would be in an amount agreed to represent the then present worth of the estimated credits under Section 6 during (a) the then estimated remaining service life of Jefferies and (b) the remainder thereafter of the fifty year period specified in paragraph 3.2.

1.4 Perform tests at the earliest feasible time in order that the Government may determine to what extent, if any, it is in the public interest to increase the average daily and weekly discharges provided for in paragraph 2.1. The Government will make available to the Authority the reports on such tests and any other information relating thereto. If it is determined that discharges can be increased, the distribution of capacity between steam electric equivalent and gas turbine equivalent set forth in paragraph 6.1 and Exhibit A will be reevaluated by the Authority and the Government, after consultation with the Federal Power Commission, and any appropriate changes will be made.

1.5 Make available to the Authority pursuant to the priority provided for in P. L. 90-483, all capacity and energy produced at St. Stephen over and above that required for station use.

1.6 Provide and install remote control facilities for the operation of St. Stephen at the Authority's existing control center at the Jefferies Steam Plant, or other mutually agreed location. As provided in Section 6, cost of maintenance of said remote control equipment will be borne by the Government.

1.7 Construct a cooling water system designed in consultation with the Authority to cool the condensing water discharge from the Jefferies Steam Plant up to a total installation of 500,000 kw after diversion of flow from Jefferies in order to conform with current or future requirements of the laws or regulations of any governmental agency having jurisdiction. For such purpose the cooling water facility will be designed to meet criteria furnished by the State of South Carolina or any successor agency having jurisdiction. Reimburse the Authority in accordance with Section 6 for operation and maintenance costs over and above the operation and maintenance costs as credited pursuant to paragraph 2.6, which would have been incurred by the Authority to meet such current or future requirements in the absence of the Project and for any adverse effects on the steam plant's efficiency.

1.8 Reimburse the Authority in accordance with Section 6 for the loss of energy generation resulting from the two-plant operations (Jefferies and St. Stephen).

1.9 Credit the Authority in accordance with paragraph 6.4 for the adverse effect of St. Stephen on rights the Authority has acquired and the facilities it has installed in preparation for expanding its hydro plant at Jefferies.

1.10 Provide the power generation, switching, metering and control facilities previously described, which shall not be inferior to the existing equipment owned by the Authority in quality and operating characteristics including, but not limited to, accuracy, speed of response, reliability, expected life and satisfactory performance of the necessary operating functions.

1.11 Acquire lands or interests therein as required for construction and operation of the Project.

1.12 Construct a fish hatchery within the confines of the real estate otherwise acquired for the Project, to be operated under easement by others than the Authority.

Section 2. Obligations of the Authority. The obligations of the Authority will include the following:

2.1 Release from Jefferies during each week (defined as the period from the beginning of Saturday to the end of Friday) an average discharge of 3,000 cfs, plus or minus five (5) percent as a permitted operational variance, but not to exceed during any day (defined as midnight to midnight) an average of 5,000 cfs, plus five (5) percent as a permitted operational variance, EXCEPT:

(1) As such quantities may be increased pursuant to paragraph 1.4.

(2) If the Government should agree either to temporary lower flows due to limited availability of water, or to greater flows. The Authority will also release temporary greater flows when such flows are determined by the Government to be in the public interest. Discharge shall be determined from either flow meters or from calculated values based on a mutually acceptable method.

2.2 Restrict any sustained period of no discharge from Jefferies to no longer than 70 consecutive hours, whether such a period is entirely within a week or extends from one week into the next. Follow any period of three days with average discharges under 1,000 cfs each with at least two days with average discharges of at least 4,000 cfs each.

2.3 Under emergency conditions affecting the Authority's system, the Authority may increase or decrease discharges beyond the requirements specified in paragraphs 2.1 and 2.2 with prior approval of the Contracting Officer or his authorized representative. If the Authority determines that an emergency situation is severe enough to constitute a risk of serious damage to facilities or breakdown of electric service in the area served by the Authority or interconnected systems, greater or lesser discharges may be made without prior approval of the Contracting Officer or his authorized representative, provided the Authority furnishes prompt notification and justification by telephone, if possible, and confirmation in writing. The Government's excess costs

resulting from such emergency discharge increases or decreases shall be appropriately compensated for by the Authority pursuant to Section 6.

2.4 Make the maximum use of the additional capacity resulting from the combined two-plant operation which the Authority deems economical and practical in light of water availability, load conditions, costs and other operating considerations. Credit the Government for the value of the increase in useful capacity of Jefferies and St. Stephen created by the Project, as determined pursuant to Section 6.

2.5 Credit the Government, pursuant to Section 6, for the value of any net increase in energy from Jefferies and St. Stephen when the combined production of Jefferies and St. Stephen is greater than the energy that could have been produced by Jefferies alone, absent rediversion.

2.6 Credit the Government, pursuant to Section 6, for any cost to provide and maintain a cooling water system at the Jefferies Steam Plant that may be required under present operating conditions (pre-rediversion) to limit the rise in temperature of the mixed discharge waters to conform with the current or future requirements of any governmental agency having jurisdiction.

2.7 Provide without cost to the United States such of its rights in lands as are required by the Government for the Project. The Authority will not dispose of the flowage easements it currently holds in the Tailrace Canal below Jefferies and along the Cooper River without approval of the Government. Any sale or lease of Authority-owned land along the Tailrace Canal or the Cooper River will reserve a flowage easement to the Authority, unless the Government agrees otherwise.

2.8 Furnish the Government by Wednesday of each week, copies of the daily logs (hydraulic and power) of Jefferies for the preceding week. The Authority shall also furnish the Government by Wednesday of each week a tentative schedule of its predicted energy requirements from St. Stephen for the following week.

2.9 Maintain and operate the cooling water system to be constructed by the Government as provided in paragraph 1.7.

2.10 Maintain Project transmission lines, Government meters on the Authority's premises and such other facilities as may be mutually agreed upon.

2.11 Control the operation of St. Stephen by remote control facilities provided by the Government pursuant to paragraph 1.6. This operation shall be within the turbine cavitation limits specified by the manufacturer. The generators shall be operated within their KVA ratings. Maintenance of remote control equipment located at the Authority's control center will be accomplished by the Authority at the Government's expense pursuant to paragraph 6.5.

2.12 Permit the Government to install capacity and energy meters in the Jefferies Hydro Plant and provide space for such meters.

2.13 Provide energy to St. Stephen for station use during periods of no generation at St. Stephen.

2.14 Accept title to the facilities and supporting real estate as described in paragraph 1.1 at the end of a 50-year term, commencing on the date of commercial operation specified in paragraph 3.2, or at an

Santee Cooper

One Riverwood Drive, Moncks Corner, South Carolina 29461-0398 • (803) 761-8000

April 23, 1986

LTC. F. L. Smith Jr.
Contracting Officer
U. S. Army Corps of Engineers
Charleston District
Post Office Box 919
Charleston, South Carolina 29402-0919

Dear LTC. Smith:

We have received your request dated April 21, 1986, to extend our current Letter of Agreement for discharges at the Jefferies Hydro Plant, until test results and recommendations are provided by the Waterways Experiment Station. Santee Cooper is agreeable to this extension.

However, as we have stated previously, the operating restrictions under the Letter of Agreement limit the operating flexibility of the Plant. If these, or any restrictions which are more stringent than those under the current Contract, are recommended to become permanent, the impact on Santee Cooper's operating flexibility will have to be addressed before Santee Cooper would accept such a recommendation.

We will await copies of the test reports and your recommendations.

Sincerely,

Kenneth R. Ford

Kenneth R. Ford
Vice President
Finance

bcc: Mr. McGlothlin
Mr. Nolte
Mr. Edwards
Mr. Inabinette

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
P O BOX 919
CHARLESTON S C 29402 0919

REPLY TO
ATTENTION OF

O & M Branch

APR 21 1986

Mr. Kenneth R. Ford
Vice-President of Finance
South Carolina Public Service Authority
Post Office Box 398
Moncks Corner, SC 29461-0398

Dear Mr. Ford:

Our existing Letter of Agreement for the interim period between the completion of the physical testing in the Cooper River and the receipt of the final flow recommendations is schedule to expire on April 25, 1986. We recommend that this Letter of Agreement be extended indefinitely until the details of the flow recommendations can be worked out. Our target date for this extension would be through June 27, 1986.

The Corps' Waterways Experiment Station has two types of recommendations. The first covers the harbor siltation and addresses the weekly average and the maximum daily conditions. This recommendation is due on April 30. The second covers the salinity intrusion and addresses the no flow condition. This recommendation is due on 30 May.

If you have any questions or comments concerning the extension or time schedule, please call.

Sincerely,

F. L. Smith, Jr.
LTC, Corps of Engineers
Contracting Officer

Santee Cooper

INTER-OFFICE COMMUNICATION

Date: January 7, 1986

To: See Distribution

From: Lonnie Carter, Financial Analyst, Forecasting & Oper. Anal.

Subject: Letter of Agreement for Interim Discharge Restrictions

Attached is a fully executed copy of the Letter of Agreement (LOA) between Santee Cooper and the Corps of Engineers for interim Contract (#DACW60-77-C-0005) flow restrictions at the Jefferies Hydro Plant until test results can be evaluated.

If you have any questions regarding the LOA, please call.

attachment

Distribution:
Mr. K. R. Ford
Mr. R. E. Rainear
Mr. R. V. Tanner
Mr. C. H. McGlothlin
Ms. E. S. Brown (original)
Mr. R. T. Nolte
Mr. J. P. Thomas
Mr. B. McCall
Mr. M. B. Inabinette
Mr. P. E. Cabaniss
Mr. T. G. Edwards
Mr. W. A. Fletcher

SANTEE COOPER AND CORPS OF ENGINEERS
COOPER RIVER REDIVERSION PROJECT
LETTER OF AGREEMENT

Santee Cooper and the Corps of Engineers entered into an agreement known as the Cooper River Rediversion Contract (Contract #DACW60-77-C-0005) on December 27, 1976. The Contract required the average weekly discharge at Santee Cooper's Jefferies Hydro Plant to be reduced to 3,000 cfs, in order to reduce silting in Charleston Harbor. Paragraph 1.4 of the Contract gave the Corps the responsibility of performing tests at the earliest feasible time to determine if any increased discharges at Jefferies Hydro are in the public interest.

Through a letter of agreement dated August 28, 1985, the Corps completed the physical testing of discharges in the Cooper River. The evaluation of the collected data and final flow recommendations will be completed on-or-about April 1, 1986. Santee Cooper and the Corps mutually agree to operate the Jefferies Hydro Plant during this interim period of December 28, 1985 through April 25, 1986 as follows:

A. Paragraph 2.1 restrictions will be increased to a weekly average discharge of 4,500 cfs. No maximum daily discharge restrictions will apply during the interim period. Contract provisions for additional releases to cool Jefferies Steam Plant Units 1 and 2 will remain in effect.

B. Paragraph 2.2 restrictions will be modified to restrict any sustained period of no discharge from Jefferies to no longer than 48 consecutive hours. The minimum daily average discharge for the remaining days or partial days will be 2,000 cfs. (Partial days will be prorated.)

C. Paragraph 6.1 will change to allow Santee Cooper to be assessed for 20 MW of added capacity at Jefferies Hydro through March, 1986 and 40 MW thereafter regardless of the capacity utilized. All energy produced at Jefferies Hydro will be priced at steam electric rates as calculated in Exhibit C of the Contract.

D. Paragraph 6.2 will change to use the directed discharge of 4,500 cfs in calculating any dredging penalty in lieu of the 3,000 cfs specified. Any discharges, required by an emergency release notice received from the Corps or the United States Geological Survey (USGS), will be in addition to the directed discharge and will not be used in determining the average weekly discharge for calculating any dredging penalty.

E. The Corps will be responsible for notifying Santee Cooper's System Controller of all emergency release notices received from monitoring stations in the Cooper River, and issuing instructions for emergency discharges. The Corps will supply Santee Cooper's Manager of Power Supply a list of personnel authorized to issue each notification. If emergency discharges are required during a period of low demand and Santee Cooper would have been able to use an energy source which is priced less than the steam electric energy rate of the Contract, then the Corps will reimburse Santee Cooper for the difference in such rates. The reimbursement will be calculated on a case-by-case basis.

F. Santee Cooper assumes no risk for claims arising as a result of this interim agreement, except those assumed under the Contract.

Approved:

William C. Mescher

Date: Dec 23, 1985

William C. Mescher
President
Santee Cooper

F. L. Smith, Jr.

Date: 30 Dec 1985

F. L. Smith, Jr., LTC
Contracting Officer
Army Corps of Engineers

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT CORPS OF ENGINEERS
P O BOX 919
CHARLESTON, S C 29402 0919

REPLY TO
ATTENTION OF

O&M Branch

September 6, 1990

Mr. Lonnie N. Carter
Corporate Forecasting
South Carolina Public Service Authority
Post Office Box 398
Moncks Corner, South Carolina 29461-0398

Dear Mr. Carter:

With the recent US District Court decision concerning our authority in relation to the protection of the Bushy Park Reservoir, it is time to proceed with processing the supplemental agreement which sets the final flow restrictions. Forwarded for your review is a proposed Supplemental Agreement Number Four which addresses the final flow recommendations and Bushy Park protection (Encl).

The proposed supplement is a revised version of a supplement discussed during the settlement conferences of the lawsuit. That supplemental was essentially acceptable by both parties at that time and seems to be a good starting point. The revisions generally covers references to the court decision, format changes, and other minor revisions.

Please contact me if you have any questions or if you want to set up a meeting to discuss the supplement.

Sincerely,

David F. Hubbard III

David F. Hubbard III
Authorized Representative
of the Contracting Officer

Enclosure

D R A F T

SUPPLEMENTAL AGREEMENT NUMBER FOUR
TO
CONTRACT NO. DACW60-77-C-0005
BETWEEN
THE UNITED STATES DEPARTMENT OF THE ARMY
AND
THE SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

THIS SUPPLEMENTAL AGREEMENT is entered into this _____day of _____, 1990, by and between the UNITED STATES OF AMERICA (the "Government") represented by the Contracting Officer executing this Supplemental Agreement, and the South Carolina Public Service Authority (the "Authority"), a corporate agency of the State of South Carolina.

WHEREAS, pursuant to the authority conferred in the Rivers and Harbors Act of 1968 (Public Law 90-483), the Government, acting through the United States Army Corps of Engineers (the "Corps") and the Authority entered into Contract No. DACW60-77-C-0005 (the "Contract");

WHEREAS, Sections 2.1 and 2.2 of the Contract specify the discharges of freshwater to be made by the Authority through its Jefferies hydroelectric facility into the Cooper River;

WHEREAS, protection of Bushy Park Reservoir against ocean saltwater intrusion is in the public interest;

WHEREAS, the Corps has determined that it is appropriate to amend the discharges specified in Sections 2.1 and 2.2 of the Contract in order to protect Charleston Harbor against excessive shoaling and to protect Bushy Park Reservoir against ocean saltwater intrusion; and

WHEREAS, as evidenced by the order of Judge Sol Blatt, Jr. dated June 7, 1990, in the case of the South Carolina Public Service Authority V. the United States Department of the Army, case number 2:89-0302-8, the Corps is authorized to amend the discharges specified in Sections 2.1 and 2.2 of the Contract in order to accomplish these purposes.

The parties therefore agree to amend the Contract as follows:

1. Insert the following sentence between the first and second sentences in paragraph 1.4: After these initial tests, the Government may perform further tests in order that the Government may determine to what extent, if any, it is in the public interest to increase or decrease the flow restrictions provided for in paragraphs 1.14, 2.1 and 2.2. The remainder of paragraph 1.4 will remain unchanged.

2. Add the following after paragraph 1.13:

1.14 Monitor and assess the salinity and tidal conditions in the Cooper River and the Bushy Park Reservoir. This assessment is to determine what discharges to prevent ocean saltwater intrusion into Bushy Park Reservoir are in the public interest. The Government will be responsible for notifying the Authority of any release notices received from the monitoring stations and issuing instructions for these discharges. If the Authority exceeds the weekly average discharges specified in paragraph 2.1 as a result of such release instructions, the credit to the Government provided in paragraph 6.2 shall not apply.

3. Delete existing paragraph 2.1 and add:

2.1 Release from Jefferies during each week (defined as the period from the beginning of Saturday to the end of Friday) an average discharge of 4,500 cfs, plus or minus five (5) percent as a permitted operational variance, EXCEPT:

4. Insert "or decreased" after "increased" in paragraph 2.1(1).

5. In the second sentence of paragraph 2.1(3), change the prescribed weekly average of "3,000 cfs" to "4,500 cfs".

6. Add the following sentence to the end of paragraph 2.1(3): In the event that the Authority estimates that it will operate Jefferies Steam Plant Units 1 and 2 for more than thirty consecutive days, it will notify the Contracting Officer.

7. Add the following after paragraph 2.1(3):

(4) If pursuant to paragraph 2.1(2), the Government agrees to temporary lower flows due to limited availability of water, the Government shall continue to monitor salinity levels in the Cooper River and the Bushy Park Reservoir, and shall continue to issue discharge recommendations to the Authority as the Government deems necessary and appropriate to prevent ocean saltwater intrusion into Bushy Park Reservoir. During these low flow periods, no release will be made through the St. Stephen Powerhouse unless it is in response to emergency conditions affecting the Authority's system.

8. Delete existing paragraph 2.2 and add:

2.2 Other operating restrictions:

2.2(1) Maximum consecutive total daily average releases from Jefferies (defined as midnight to midnight) for any 1, 2, 3, and 4 day periods shall not exceed 10,000; 17,000; 24,000; and 31,500 cfs; respectively, plus five (5) percent as a permitted operational variance.

2.2(2) Restrict any sustained period of no discharge from Jefferies to no longer than 60 consecutive hours, whether such a period is entirely within a week or extends from one week into the next. Follow any period of two consecutive days each with an average discharge under 2,000 cfs with at least one day with an average discharge of at least 4,500 cfs.

9. In the phrase in parentheses of paragraph 9.1, change "paragraphs 2.1 and 2.2" to "paragraphs 1.14, 2.1, and 2.2".

10. In an appeal pending before the Corps of Engineers Board of Contract Appeals, the Authority is asserting a claim for additional compensation under the Contract, and the Government is asserting defenses to that claim. This Supplemental Agreement is not intended to, and does not, limit any claim or defense by either party.

11. Except as otherwise provided in this Supplemental Agreement, all terms and conditions of the Contract shall be and remain in full force and effect.

D R A F T

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first written above.

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

By:_____
Kenneth R. Ford
President and Chief
Executive Officer

THE UNITED STATES OF AMERICA

By:_____
James T. Scott
LTC, Corps of Engineers
Contracting Officer